Susan M. Hagan

# The Space between Look and Read

Designing Complementary Meaning

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# The Space between Look and Read

## Designing Complementary Meaning

Susan M. Hagan

The MIT Press
Cambridge, Massachusetts
London, England

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The MIT Press would like to thank the anonymous peer reviewers who provided comments on drafts of this book. The generous work of academic experts is essential for establishing the authority and quality of our publications. We acknowledge with gratitude the contributions of these otherwise uncredited readers.

This book was set in Stone Serif and Stone Sans by Westchester Publishing Services.

Library of Congress Cataloging-in-Publication Data

Names: Hagan, Susan M., author.
Title: The space between look and read : designing complementary meaning / Susan M. Hagan.
Description: Cambridge, Massachusetts : The MIT Press, [2023] | Series: Design thinking, design theory | Includes bibliographical references and index.
Identifiers: LCCN 2022033265 (print) | LCCN 2022033266 (ebook) | ISBN 9780262545471 (paperback) | ISBN 9780262374293 (epub) | ISBN 9780262374309 (pdf)
Subjects: LCSH: Graphic design (Typography) | Illustration of books.
Classification: LCC Z246 .H34 2023 (print) | LCC Z246 (ebook) | DDC 686.2/2—dc23/eng/20221031
LC record available at https://lccn.loc.gov/2022033265
LC ebook record available at https://lccn.loc.gov/2022033266

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For my son Ky

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## Series Foreword

As professions go, design is relatively young. The practice of design predates professions. In fact, the practice of design—making things to serve a useful goal, making tools—predates the human race. Making tools is one of the attributes that made us human in the first place.

Design, in the most generic sense of the word, began over 2.5 million years ago when *Homo habilis* manufactured the first tools. Human beings were designing well before we began to walk upright. Four hundred thousand years ago, we began to manufacture spears. By forty thousand years ago, we had moved up to specialized tools.

Urban design and architecture came along ten thousand years ago in Mesopotamia. Interior architecture and furniture design probably emerged with them. It was another five thousand years before graphic design and typography got their start in Sumeria with the development of cuneiform. After that, things picked up speed.

All goods and services are designed. The urge to design—to consider a situation, imagine a better situation, and act to create that improved situation—goes back to our prehuman ancestors. Making tools helped us to become what we are: design helped to make us human.

Today, the word *design* means many things. The common factor linking them is service, and designers are engaged in a service profession in which the results of their work meet human needs.

Design is first of all a process. The word *design* entered the English language in the 1500s as a verb, with the first written citation of the verb dated to the year 1548. *Merriam-Webster's Collegiate Dictionary* defines the verb *design* as "to conceive and plan out in the mind; to have as a specific purpose; to devise for a specific function or end." Related to these is the act of drawing, with an emphasis on the nature of the drawing as a plan or

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map, as well as "to draw plans for; to create, fashion, execute or construct according to plan."

Half a century later, the word began to be used as a noun, with the first cited use of the noun *design* occurring in 1588. *Merriam-Webster's* defines the noun as "a particular purpose held in view by an individual or group; deliberate, purposive planning; a mental project or scheme in which means to an end are laid down." Here, too, purpose and planning toward desired outcomes are central. Among these are "a preliminary sketch or outline showing the main features of something to be executed; an underlying scheme that governs functioning, developing or unfolding; a plan or protocol for carrying out or accomplishing something; the arrangement of elements or details in a product or work of art." Today, we design large, complex processes, systems, and services, and we design organizations and structures to produce them. Design has changed considerably since our remote ancestors made the first stone tools.

At a highly abstract level, Herbert Simon's definition covers nearly all imaginable instances of design. To design, Simon writes, is to "[devise] courses of action aimed at changing existing situations into preferred ones" (Simon, *The Sciences of the Artificial*, 2nd ed., MIT Press, 1982, p. 129). Design, properly defined, is the entire process across the full range of domains required for any given outcome.

But the design process is always more than a general, abstract way of working. Design takes concrete form in the work of the service professions that meet human needs, a broad range of making and planning disciplines. These include industrial design, graphic design, textile design, furniture design, information design, process design, product design, interaction design, transportation design, educational design, systems design, urban design, design leadership, and design management, as well as architecture, engineering, information technology, and computer science.

These fields focus on different subjects and objects. They have distinct traditions, methods, and vocabularies, used and put into practice by distinct and often dissimilar professional groups. Although the traditions dividing these groups are distinct, common boundaries sometimes form a border. Where this happens, they serve as meeting points where common concerns build bridges. Today, ten challenges uniting the design professions form such a set of common concerns.

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Three performance challenges, four substantive challenges, and three contextual challenges bind the design disciplines and professions together as a common field. The performance challenges arise because all design professions

1. act on the physical world,
2. address human needs, and
3. generate the built environment.

In the past, these common attributes were not sufficient to transcend the boundaries of tradition. Today, objective changes in the larger world give rise to four substantive challenges that are driving convergence in design practice and research. These substantive challenges are

1. increasingly ambiguous boundaries between artifacts, structure, and process;
2. increasingly large-scale social, economic, and industrial frames;
3. an increasingly complex environment of needs, requirements, and constraints; and
4. information content that often exceeds the value of physical substance.

These challenges require new frameworks of theory and research to address contemporary problem areas while solving specific cases and problems. In professional design practice, we often find that solving design problems requires interdisciplinary teams with a transdisciplinary focus. Fifty years ago, a sole practitioner and an assistant or two might have solved most design problems. Today, we need groups of people with skills across several disciplines and the additional skills that enable professionals to work with, listen to, and learn from each other as they solve problems.

Three contextual challenges define the nature of many design problems today. While many design problems function at a simpler level, these issues affect many of the major design problems that challenge us, and these challenges also affect simple design problems linked to complex social, mechanical, or technical systems. These issues are

1. a complex environment in which many projects or products cross the boundaries of several organizations, stakeholder, producer, and user groups;

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2. projects or products that must meet the expectations of many organizations, stakeholders, producers, and users; and
3. demands at every level of production, distribution, reception, and control.

These ten challenges require a qualitatively different approach to professional design practice than was the case in earlier times. Past environments were simpler. They made simpler demands. Individual experience and personal development were sufficient for depth and substance in professional practice. While experience and development are still necessary, they are no longer sufficient. Most of today's design challenges require analytic and synthetic planning skills that cannot be developed through practice alone.

Professional design practice today involves advanced knowledge. This knowledge is not solely a higher level of professional practice. It is also a qualitatively different form of professional practice that emerges in response to the demands of the information society and the knowledge economy to which it gives rise.

In his essay "Why Design Education Must Change" (from *Core77*, November 26, 2010), Donald Norman challenges the premises and practices of the design profession. In the past, designers operated on the belief that talent and a willingness to jump into problems with both feet gives them an edge in solving problems. Norman writes:

> In the early days of industrial design, the work was primarily focused upon physical products. Today, however, designers work on organizational structure and social problems, on interaction, service, and experience design. Many problems involve complex social and political issues. As a result, designers have become applied behavioral scientists, but they are woefully undereducated for the task. Designers often fail to understand the complexity of the issues and the depth of knowledge already known. They claim that fresh eyes can produce novel solutions, but then they wonder why these solutions are seldom implemented, or if implemented, why they fail. Fresh eyes can indeed produce insightful results, but the eyes must also be educated and knowledgeable. Designers often lack the requisite understanding. Design schools do not train students about these complex issues, about the interlocking complexities of human and social behavior, about the behavioral sciences, technology, and business. There is little or no training in science, the scientific method, and experimental design.

This is not industrial design in the sense of designing products, but industry-related design, design as thought and action for solving problems and imagining new futures. This MIT Press series of books emphasizes

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strategic design to create value through innovative products and services, and it emphasizes design as service through rigorous creativity, critical inquiry, and an ethics of respectful design. This rests on a sense of understanding, empathy, and appreciation for people, for nature, and for the world we shape through design. Our goal as editors is to develop a series of vital conversations that help designers and researchers to serve business, industry, and the public sector for positive social and economic outcomes.

We will present books that bring a new sense of inquiry to design, helping to shape a more reflective and stable design discipline able to support a stronger profession grounded in empirical research, generative concepts, and the solid theory that gives rise to what W. Edwards Deming described as profound knowledge (Deming, *The New Economics for Industry, Government, Education*, MIT, Center for Advanced Engineering Study, 1993). For Deming, a physicist, engineer, and designer, profound knowledge comprised systems thinking and the understanding of processes embedded in systems, an understanding of variation and the tools we need to understand variation, a theory of knowledge, and a foundation in human psychology. This is the beginning of "deep design"—the union of deep practice with robust intellectual inquiry.

A series on design thinking and theory faces the same challenges that we face as a profession. On one level, design is a general human process that we use to understand and to shape our world. Nevertheless, we cannot address this process or the world in its general, abstract form. Rather, we meet the challenges of design in specific challenges, addressing problems or ideas in a situated context. The challenges we face as designers today are as diverse as the problems clients bring us. We are involved in design for economic anchors, economic continuity, and economic growth. We design for urban needs and rural needs, for social development and creative communities. We are involved with environmental sustainability and economic policy; agriculture, competitive crafts for export, competitive products and brands for microenterprises, developing new products for bottom-of-pyramid markets, and redeveloping old products for mature or wealthy markets. Within the framework of design, we are also challenged to design for extreme situations; for biotech, nanotech, and new materials; for social business; as well as for conceptual challenges for worlds that do not yet exist (such as the world beyond the Kurzweil singularity) and for new visions of the world that does exist.

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The Design Thinking, Design Theory series from the MIT Press will explore these issues and more—meeting them, examining them, and helping designers to address them.

Join us in this journey.

Ken Friedman
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## Before in Time and Place: Shukran

Writing rewired my drawing, opening a first space between look and read, making it possible to see the world I would finally inhabit.

Writing was the last thing on my mind when I entered a joint master's program between the School of Design and the Department of English at Carnegie Mellon University. In the space between those two buildings were the Fence[1] and the food carts, an explorational Twilight Zone where "what I need"[2] appeared as I needed it. On my first day, I needed to hear the opening remarks, or my expectations might have gone the usual route of trying to meet everyone else's. Luckily, I was there when Professor Dan Boyarski, a future mentor, committee member, and one of the founders of that interdisciplinary program told us, "We don't know what the connections are. It's your job to find them." Dan set us free that day to get it wrong and try again, to practice those intertwined skills of focus and musing that invention requires.

But I did not think there was much to find in a writer's space. I constructed myself through my eyes, not my ear. Luckily, my eyes were late to registration. I ended up taking more classes in writing than I had intended. In one of those classes, I met Kate Wilson whose care with text and kindness to someone without that background are qualities I admire to this day. And there was still the opportunity to study drawing with Mark Mentzer. Watching Mark draw requires patience so that learning can travel from eye to hand. For me, that experience would form a link with writing scenic description that similarly requires patience to sit and watch over time, allowing the mundane to become remarkable. In those intertwining activities, writing became relevant. Observing a place for its over-time energy, so that I could write about it, closed the space between looking and languaging

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as it entered my hand, so that I could draw it, showing the energy of time embedded in the form. I thought I'd found my thesis. Observing the energy of a place for the language it holds melds with feeling the energy of movement for the marks that it makes, leading to qualities of line and shade and honesty that surprised me. Text finally made sense in a world that had been all about the visual.

I took my looking, marking, languaging moment to Professor Dave Kaufer, the other founder of the program, who would later become the head of my committee and have such a positive impact on my life and work. I will always be grateful for his mentorship, thoughtful questions, and valuable insights. But at that moment, I saw myself immersed in the analysis of pre- and post-treatment drawings, ready to explore language in its proper place—as the servant to visual prowess. But with my mind finally attuned to text, I saw (pardon me—read) an article in *Eye Magazine* by Richard Hollis called "Multiple Meanings" (1997) where I discovered Uwe Loesch's Geschichte als Argument (History as Argument) for the first time. It would in time become the case study for chapter 2 (see figure 2.1) where I introduce Inter-play analysis. But I digress. Loesch's design synthesized visual information with text in a way that changed the meaning of both. In that space between look and read, Loesch redefined both history and argument. The invitation to reflect triggered by such elegant concision became the connection that Dave and Dan's inspired program made possible. Understanding this and other image, text, and typeface inter-weavings demanded both eye and ear.

My ear was not trained, which meant a longer stint studying rhetoric as a doctoral student, where I became an interdisciplinary soul connected to the examples I collected. Their visual/verbal secrets began to make some sense when another of my future committee members, Professor Barbara Johnstone, introduced me to a little book called *Cohesion in English* (Halliday & Hasan, 1976) that was to become one of the seeds for the Grouping and Bridging Ties developed in chapters 3 and 4. But while connections between image and text are critical to my work, my argument centered on the idea that image, text, and typeface are profoundly different. Hearing this, my committee member and future mentor, Professor Chris Neuwirth pointed me to the work of Allan Paivio (1986, 2007), a cognitive psychologist, whose seminal research on dual coding provides the reasoning behind the profound differences that exist between image and text—reasoning that

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the introduction and chapter 1 cover more carefully. These four people, their insights and encouragement, showed me that the process of inquiry may be frustrating, but it is also exhilarating. Good thing because this has been a longer project. I got some things right back then, a few things wrong, and had yet to accept as part of this framework the less noble image/text relationships that suggest images can be little more than an emotional or manipulative device. What started back then as a series of structured observations would eventually become a seven-category framework (introduction, chapter 5) with a method of analysis (chapter 2) based on the principle of relative certainty (chapter 1). Thanks cannot end here.

Support from those advisors continued even as the circle increased. Along the way I tried out ideas in the classroom. Early in the process, when my thesis was little more than felt difficulty, Jay Hauser produced effective and elegant design that convinced me I was on the right track and should stay on it. My good friend and colleague Martha S. Cheng has supported these ideas from the time we were both doctoral students, continuing that support when I decided to move to Qatar. Invited to see that campus, I knew I could never live so far away from home. But after hearing a student ask, "how do we keep them from hating us," where the "us" was Westerners like me, I had to go. There I met Kira Dreher, a teaching professor of English, who in addition to becoming a dear friend, has provided invaluable insights on chapters and an energy about research that is infectious in the best way. In Qatar, I would also meet Dr. Alicia Salaz, now vice provost and university librarian at the University of Oregon. She is a patient friend and reader of many chapters, who when I toyed with the idea that failure was an option, took the time to discuss that option. It is not an overstatement to say that her willingness to read my work in progress kept me at the process of rewriting when some ideas weren't communicating in the way I intended. My thanks too to Jennifer Bruner, a teaching professor of psychology who introduced me to Baddeley's theory of working memory. Back in Pittsburgh, Ky Zizan helped me understand when my writing would lose my readers before they finished the first sentence. Students on both campuses have asked questions and created work that blew me away. This book includes some of their designs.

I am convinced that a problem like this needs time for reflection, assessment, and frustration to arrive at a solution. Thanks to my colleagues in Information Systems in Pittsburgh and Doha for their support and

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friendship. And the IT folks, especially Kamal Taynaz who worked well past end of day when my computer threatened to turn into a paper weight.

An intellectual home is necessary but not sufficient to feed a new idea. An early space outside my home was the PhD design research list where I met Ken Friedman. When I wrote my first post, not everyone was sure if a freshly minted PhD was ready to enter the conversation. Ken supported my right to speak and has acted as a mentor to me and others like me. His thoughtful critique often lives behind the scenes, but make no mistake, Ken has been a champion of women's scholarly contributions long before it became fashionable to do so. His love of intellectual rigor and strong argument are qualities I aspire to, but it's always a game of catch up. He and Erik Stolterman are of course the editors of the series that includes this book. I was lucky to work with Erik when we developed a special issue of *Artifact* that explored the relationship between research and practice (2007). My thanks to both for their belief in the ideas in this book, even though that is not nearly enough to express my appreciation.

At MIT Press, Noah Springer PhD, Acquisitions Editor, helped me fully see that I'd captured more than I realized and how to frame it in ways that I had missed. Lillian Dunaj, Acquisitions Assistant, has kept a complicated process from feeling overwhelming. Within the MIT sphere live the unknown reviewers, every one of which I wish I could thank by name. If you found value in my drafts, I am grateful for your needed enthusiasm and advice. If you found less, you helped me see where I either needed to expand or explain myself. I am in your debt. At Westchester Publishing, I will be forever grateful to Christine Marra, Senior Production Editor whose guidance is a gift to any writer. Thanks are not enough to show my appreciation to Susan Free for her careful proofing and Robie Grant for indexing this book.

In the search to obtain permission to use some of the examples found in this book, I must thank Dan Boyarski, Ferdinand Ulrich, and Bernard Stein (whose work is also featured in these pages). I will never forget your kindness.

The conferences where I was able to try out earlier versions of these ideas or perspectives on other paths include those sponsored by DRS, MODE, CONFIA, and RSA. My introverted self loves those spaces because they are where invention finds its paradoxical tools: focus and daydreaming. At MODE, the motion design education conference founded by R. Brian Stone,

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Gretchen Caldwell Rinnert, and Andre Mūrnieks, researchers, educators, and students find support and insightful feedback. That space inspired an opportunity to consider motion and sound through the lens of the Stroop effect (Hagan, 2019b). CONFIA is an international illustration conference and the brainchild of Paula Tavares where I met Alan Male, who provided me with the opportunity to explore ideas related to visual/verbal collaboration through the lens of illustration as a contributor to his book, *A Companion to Illustration* (Hagan, 2019a).

Ideas need focus and play and friends who stand by you, making you feel wanted—all the things that really make life matter—and this other stuff possible. Good friends who make gatherings and ballgames, good food and weekend trips happen, and don't let you lose it when a Budapest street thief sees you coming. Thank you for the sanity you bring and your unfaltering friendship. In Pittsburgh, Kathy and Davis Raborn, John F. Clines, Susan Chikala, Mary Davis Smith, Kathryn Katafiasz Pepper, Lisa Thomas Zourelias, Janet Sieff and John Berkman, Clara Gautier, Nancy V. Seifert, and Barbara Simpson have brought joy and understanding. And good friends and colleagues in Qatar, though some have moved—thank you Natalia Gatti, Silvia Pessoa and Erik Helin, Dalia Rehal, Amie Rollins, Marina Vika, Jeffrey Squires, Davide Fossetti, Murry Evans, Mark Stehlik, Christine Gilchrist, Samer El-Karanshawy, Alex Wilcox Cheek, Teresa Ashe MacGregor (go Team Library), Mohana Rajakumar, Denielle Emans, and David and Jennifer Gray. There's such a sweetness and kindness in all of you. It feels good to have a chance to tell you publicly. Last of all, I'm grateful for those bonds that time creates—to Richard P. Zizan, and to my brother James R. Hagan and his wife Patricia, my nieces Laura Petronis and Jennifer Gans, and my nephew Patrick Hagan and their families.

This book was made possible by the generous support of the Qatar Foundation through Carnegie Mellon University in Qatar's Seed Research Funding program. The statements made herein are solely the responsibility of the author.

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# Introduction: The Framer in the Framework: Roles, Relationships, and Outcomes

"Not everyone who drives drunk dies."

In 1986, the art director Sal DeVito and writer Jamie Seltzer paired that statement with a closeup of a young man whose face was scarred by an accident he alone caused and survived. The image not only provided visual proof that "not everyone . . . dies," it simultaneously changed the text's meaning, which by itself was a cynical suggestion that not every terrible decision has consequences. When this young man looks straight into the camera, he sacrifices himself, willing to memorialize who he is through the lens of his worst decision so that we can avoid what he cannot.[1] The poster of this ordinary kid saddled with a terrible aftermath is an example of complementary meaning—meaning that lies neither within the text nor the image but in the space between the two. The image offers critical information but communicates only a part of the message. The text alone offers misdirection. But together, their combined meaning is profound.

Designers have long united look with read. Their stroke-of-genius inventions are necessary in a field built on creative practice, but those artifacts are not sufficient to exhaust the potential of this form of communication. With that opportunity in mind, this book offers a framework that identifies the roles that image, text, and typeface play in creating collaborative messages; the loose to tight relationships that tie the three together; and the outcomes those relationships reveal in the form of Inter-play and its seven categories with particular focus on complementary meaning, which encourages critical thought.

As an analytical tool, the framework reveals why one design is probative, offering reasons or proof for claims, moving an argument forward,

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while another manipulates, decorates, or makes questionable claims easier to swallow. As a tool for practice, identifying differences between probative and non-probative Inter-play leaves designers better equipped to create the first and avoid the second. The framework can act as a springboard to invention because the roles, relationships, and outcomes it reveals uncover the parts necessary to build anew.

The *roles* that image, text, and typeface play in building meaning contribute unique value because each modality offers what the others cannot, encouraging invention to tap into these identifiable opportunities and constraints. But to be usable, these unique roles must form *relationships* through the ties between them that we first notice and then interpret. Relationships lead to a continuum of outcomes from the tentative, to the merely persuasive, to the reasoned. The analysis of each example of excellent design presented here encourages past practice to act as a springboard to new possibilities, especially within the realm of complementary meaning—the heart of this book.

## Fundamentally and Profoundly Different

I ask you to bear with me as my core assumption might oppose your own hard-earned point of view. The multidisciplinary perspectives that inform this work, make my intellectual home harder to pin down. Those perspectives include contributions from cognitive psychology, fine art, discourse analysis, design, and rhetoric, all areas that value the visual and the textual. While diverse, they are the roadmap to a destination, *a framework for interaction between image, text, and typeface that I call Inter-play, and a deeper understanding of its subset: complementary meaning*.

Complementary meaning begins when the unique contributions made by images, text, and typeface (later chapters in the book touch on motion and sound) collaborate as equals to offer claims linked to reasons or proof in messages that would significantly change if one of the modalities were altered or removed. We need many tools to make positive change in the world. This is just one option in the kit, but one that I argue has the potential to address problems caused by inexperience, bias, and the struggle to imagine a world for its contradicting complications. Put more simply, complementary meaning's contribution to design and communication lies in its ability to clarify, challenge, or contradict problematic positions, often with an immediacy not available to text and a specificity not possible with

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images alone. While that is complementary meaning's basic definition, to do it justice takes every example of expert practice in this book. But first, there is the business of disclosing that fundamental assumption.

Images and text are *fundamentally and profoundly different* in three ways: experiential, structural, and sense based.

### Experiential Differences: Direct versus Indirect

Differences in the ways image and text inform experience emerge in the seminal work on dual coding by the psychologist Allan Paivio (1986, 2007), the theory of working memory (Baddeley, 1992, 2010), and cognitive load theory (Sweller, 2011). Paivio's dual coding, where I place my emphasis, is often cited in educational materials research (Mayer, 2002, 2010; Plass & Kalyuga, 2019; Ponari, Norbury, & Vigliocco, 2018; Weinstein, Madan, & Sumeracki, 2018). As a building block for the framework of Inter-play, Paivio's dual codes show how direct (often visual) and indirect (textual) experience help us make sense of the world. Knowledge needs direct experience as its growing medium before organizing it into indirect/abstract experience. Courage, for example, is better understood after watching someone make their own safety less important to prioritize the safety of another. Our memories grow as our environment interacts with ourselves, which we then organize through the dual codes of direct experience and indirect abstractions. Images, the hard copy outside the mind, relate to direct wordless experience. A picture shows a living being lying on a surface. That nonverbal direct experience becomes indirect when we read about the thing that meows called a cat who seems to like sleeping on a mat. Chapter 1 elaborates on Paivio's work and the implications that the dual codes offer designers. But images and text are not just experientially different. As chapter 1 will show, it's important to emphasize that they are also structurally dissimilar.

### Structural Difference: Linear versus Spatial Sequence

This principle of dissimilarity extends to the structures of texts versus images (Just & Carpenter, 1980; Schnotz & Wagner, 2018). In English, text demands specific linear sequences, or the grammar that produces statements, questions, and demands (Olson, 1994) is rendered moot. Images are a bit more complicated. Unlike text, they are simultaneously available for processing. However, due to the eye's physiology (Solso, 1994, 2003), they cannot be

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simultaneously processed (Paivio, 1986, 2007). The eye can only capture tiny bits of image information in focus as it jumps from point to point. Chapter 1 has more to say on this topic, but in a nutshell, just as reading reveals statements, questions, and demands through a linear sequence, looking reveals objects in spatial relationships with colors and textures that make one object unlike others as we move our eyes through idiosyncratic sequences (Schnotz & Wagner, 2018). These sequences change according to our histories, personal interests (Solso, 1994, 2003), or our tasks (DeAngelus & Pelz, 2009; Yarbus, 1967). These linear-units versus spatial-forms trigger different senses, the last fundamental dissimilarity.

### Sense-Based Differences: The Ear versus the Eye

Images and text are not just unlike experiences and structures. Each connects in its own way to different senses: sound and sight. Whether written or spoken, language builds from phonemes (Trager & Bloch, 1941), the sound-types that are the em's and ah's that produce words, phrases, and sentences. Every linear textual *sequence* is made from these units of sound, working together to deliver a message that can be shared and reshared so that information remains relatively, if somewhat elusively, stable.

The images we see, whether realistic or abstract, emerge from photons made visible by light. Every color or spatial relationship develops from those units working together to produce a meaningful whole. Because we can name what we see or silently comprehend the typeset line, the distinction between sight and sound seems to diminish.[2] But the difference embedded in photons and phonemes is still significant. In part, this is because images capture communication aspects with no textual equivalent (Bateman, 2014; Gries, 2015; Wysocki, 2001). Similarly, text has specific qualities of framing and grammar that have no image counterpart (Olson, 1994). Consider how a picture of our mothers can trigger the sound of her voice, but for someone unfamiliar with her, sight will not forecast her pitch or rhythm.

While images and words are somewhat easy to separate as sight and sound, typeface is an intriguing hybrid. Consider the phonemes embedded in typeface. Written text does not lose its roots in sound simply by representing language in a thousand different faces. If you know the agreed-upon shapes, the sounds emerge. But the phonemes of a unique alphabet with shapes you do not recognize will remain hidden, becoming a set of complicated forms. They may be lovely, but the sounds will be lost to you.

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While sounds attach to typeface when we know the basis for its alphabet, photons are also clearly present. Drucker (1994) points out that typeface does more than simply reveal shape. It marks its text. Walker (2014) identifies everyday interrelationships between linguistics and typographic materiality that include the paper it is printed on. Schriver (1997) suggests the rhetorical nature of the enterprise as each aspect affects the other. In other words, the typeset text is not simply a visual representation of sounds. Doyle and Bottomley (2009) have categorized some of those effects, where typeface offers elements of meaning that are independent of the words they contain. More about that in chapter 2.

Typeface as a hybrid of sound and sight, represents a performance more often recognized in speech (Austin, 2013). Consider a silent reading of the sentence, "He's a great guy." Is he really a *great* guy? Inflection tells us if the statement is sincere or sarcastic, even within a silent reading. This performance of sound, as Merriam-Webster (n.d.) tells us, can come from internal stimuli—the inflections and volume heard with our mental ear.[3] How the sounds are emphasized, drawn-out, or downplayed, whether by a speaker or an internal reader, is key to their meaning. Intentions like sarcasm are part of the illocutionary act (Searle, 1976).

Additionally, metadiscourse such as frame markers like "my reason for . . ." help illuminate these illocutionary acts, which are also expressed through typeface as when *stress* becomes **STRESS**. Avenir Book Oblique and Helvetica Condensed Black have different effects where the boldface appears more rugged, while the oblique has more forward momentum (Doyle & Bottomley, 2009). This attribute of ruggedness or movement washes over the sounds of the words, adding the direct experience of the visual to the indirect experience of the textual.

## The Principle of Dissimilarity Becomes *The Principle of Complementary Difference*

Experiential, structural, and sense-based differences suggest that those of us who live within the loose coalition of dissimilarity proponents have a point (Atwan, 2005; Faigley, George, Palchik, & Selfe, 2004; Gries, 2015; Kinross, 1986; Kjeldsen, 2015b; Meggs, 1992; Olson, 1994; Skolos & Wedell, 2006; Wysocki, 2001).[4] Image and text are independent ways of knowing with structural and functional differences (Paivio, 2007). But as we all agree, if complete divergence were the rule, the two could not collaborate. They

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would be like jaguars and poison dart frogs sharing the general vicinity in the Brazilian rainforest but unable to mate. Instead, image and text are more like howler monkeys and kapok trees, which have a complementary relationship between respiration and housing. The principle needs a caveat that Paivio provides.[5] His dual codes resolve the principle of dissimilarity by noting that one modality can form references and associations with the other. I can call what I use to eat breakfast my Star Wars spoon. But if I didn't know the word "spoon," something would still exist that lets me eat my cereal. An image of it would show the depth of the bowl and the length of the handle. And while knowing the word "spoon" does not let me finish my Magic Spoon Cereal, that keyword would help a friend show me what drawer the spoons are in before the stuff goes soggy. The object and the word feel similar, but they are not. When I think of the word spoon, I visualize a Dansk Torun, the ones made in Japan. Seeing that name on eBay helps me add to my collection, but I'll still need to see the actual object magnified because that's the closest I can come to knowing what "excellent used quality" suggests. As my eBay experience reveals, no list of adjectives, a mere reference, can make image and word perform the same functions. But they can relate one to another, changing the principle of dissimilarity to the more nuanced principle of complementary difference.

Complementary difference also connects direct and indirect ways of knowing through associations. Associations emerge when an image triggers a verbal concept or vice versa. An illustration of Maine coons and standard poodles on an umbrella triggers "it's raining cats and dogs." While we have not seen such an event, the saying reminds us of an association that demonstrates words can have multiple meanings (Hopper & Closs Traugott, 2003) that often build understanding through metaphor (Lakoff & Johnson, 1980). This plasticity of associations begins to reveal that images can alter the ordinary meaning of text and text can alter the ordinary interpretation of images. As the chapters will show, the principle of complementary difference is made more interesting because this slippage between the two has consequences for design.

## The Trouble with Imagining: "Reading" the Visual, "Seeing" the Verbal

Imagining text from images and images from texts is natural. Given that references and associations create interconnections, it is unsurprising that

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an image in isolation can feel like it "speaks" to an individual. However, while one person might "read" a command to serve their country, another might interpret it in an entirely different way. Unless that jpg or png has taken on the status of a symbol, what one person "hears" many people will not, and certainly not in any quotable way (Olson, 1994). Olson points out that images cannot form quotable statements, questions, or demands as they lack the agreed-upon structure. But Kress and Van Leeuwen (1996) argue for a grammar of images that while not quotable would lead to normative interpretations of image structures within the social group. In light of references and associations their argument is tantalizing, but achieving the goal might be an uphill climb. Müller, Kappas, and Olk (2012) observed participants as they interpreted what they saw in images and concluded that individual variation is the norm. They state, "differences in interpretation suggest that analyses of visual exploration and reactions should take the individual interpretation into account and not assume a priori that the meaning of an image is shared by all viewers" (p. 320). In other words, even if you and I have similar backgrounds, when we see the same picture of a desert with camels and caretakers, you might think about the freedom possible in miles of sand, while I feel its isolation.

Just as images can spark individual "texts," actual text can invite scenic imaginings where each person constructs their own view. In the absence of aphasia or lesser abilities to imagine sights (Dijkstra, Bosch, & van Gerven, 2017; Faw, 2009), the mind's eye makes some—thing. But it is unique to the person and often not fully realized (Mendelsund, 2014). When individual imagining does not need specificity to guide the experience, it can become artful (Kaufer & Butler, 2000). Unfortunately, when imagining takes place through the lens of inexperience or bias, the result can undermine intention. In those cases, the beauty of the imagination becomes the bane of problem-solving. Chapter 1 provides an example for those who remain skeptical.

## On Selection Criteria for Design: The Value of *Difference* in Complementary Difference

The allure of references and associations continues to encourage us to place more weight on the similarities between the image and text. And even though no one who argues for image reading would say that image and text are the same things, prioritizing semantic qualities in images seems to raise

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their worth. In similar fashion, text likes to boast that its scenic descriptions simulate for the mind's eye a version of what images offer the physical eye.

I'd like to suggest that a focus on similarities is an impediment to problem-solving. In this moment, I ask that you put any preferences for languaging the image or visualizing the text to the side for one crucial reason. A focus on similarities undermines decisions concerning when to use images versus text, and what combination of image, text, and typeface will improve an argument. In other words, how does a designer choose what should be in the actual text and what should be an actual image? Chapter 1 will show that these features are unique contributions to meaning. And while "imaging" through text has value for design as chapter 7 will show, a text's unique contribution lives in its ability to produce statements, questions, and demands. If you can "say" it in images or "see" it in text, design is in danger of falling into novelty and redundancy in its modality selections. It leaves us less able to design for those unwilling to "see" or "read" in ways that reflect the designer's intention.

What an audience does not know, they cannot imagine. And what they do not like, they will be hard-pressed to imagine along hoped-for lines. Arguments must consider these initial perspectives or the work will fail to offer food for thought. Selection criteria concerning image, text, and typeface must acknowledge this need, considering each modality's strengths and limitations. Chapter 1 considers this at length while other chapters build on that foundation. Once decisions on roles emerge, the relationships between image, text, and typeface must be noticed and interpreted.

### Relationships: Grouping and Bridging Ties

Images, text, and typeface tie in two ways: groups and bridges. The first invites noticing while the second invites interpreting. While theories from art and methods from discourse analysis begin to open a window on these connections, in Inter-play, both types of ties must be re-envisioned to account for the space between look and read that make these connections unique. *Grouping* and *Bridging Ties* solve that problem. Grouping Ties create material relationships between image, text, and typeface that signal a connection exists. They are inspired by Rudolf Arnheim's (1974) insights concerning how a painting's individual shapes unify into a compositional whole. Arnheim's corpus, with one exception, focused on visual relationships. His unifiers emerge

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from a wordless world and do not need to account for the complementary effects of text and typeface.[6] Grouping Ties show how independent ways of knowing unite despite their differences. For example, the seemingly natural ability of word and typeface to share the same location needs to be teased apart because typeface effects range from subtle to profound. As an organizing structure, we need the *shared-location group* to account for the presence of the word and the fact that it is not the same as the typeface. No unifier in Arnheim's work accounts for it. From another angle, Grouping Ties do not predict outcomes. They attune us to the variety of ways that image, text, and typeface relate. Any resulting effects depend on the content they group.

Grouping Ties invite us to notice a relationship. Most of the time, the connection is not complete without Bridging Ties that create bonds between image, text, and typeface that aid interpretation. When text stands alone, M. A. K. Halliday and Ruqaiya Hasan's (1976) *Cohesion in English* brilliantly identifies how relationships between sentences live outside of any rule-based engagement. Studying cohesion for its value in multimodal environments is an interest that others share (Acartürk, Taboada, & Habel, 2013; Engebretsen, 2012; Liu & O'Halloran, 2009; Thomas, 2009). My interdisciplinary roots encouraged me to be an early adopter (Hagan, 2007)[7] as Halliday and Hasan's outside-the-rules connections inspired me. But cohesion, while enticing, is rightly limited to single modality connections. Bridging Ties span the differences between spatial and sequential elements that similarly connect outside a formal set of rules.[8] For example, the words "Figure 1" suggest a *proxy-bridge* between the text and a relevant image that could be on a different page. A tighter *pairing-bridge* forms between "not everyone who drives drunk dies" and the photograph

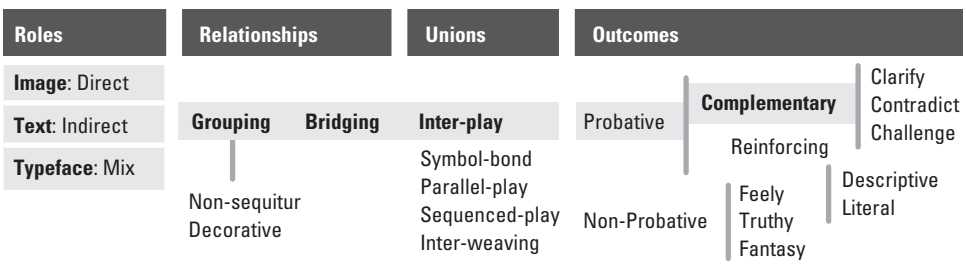


**Figure I.1**
Roles, Relationships, and Outcomes (S. Hagan). © 2022.

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of the young man scarred by drunken driving discussed earlier. Chapters 3 and 4 provide more details on the Grouping and Bridging Ties that make Inter-play possible.

### The Umbrella Outcome: Inter-play

As Figure I.1 shows, these parts lead to unions that hold problem-solving options. Specific Grouping Ties pair with subsets of Bridging Ties to produce the loose to tight types of Inter-play: parallel-play, sequenced-play, symbol-bond, and inter-weaving. Chapter 5 offers details concerning which ties create each type. These loose to tight unions result in outcomes that can be either non-probative or probative.[9] By probative, I mean that within the constraints of these two-dimensional environments, one can examine the relationship and decide if the argument is more likely true than not. I take Magritte's point, "Ceci n'est pas une pipe."[10] Yes, the image is not the same as the thing, but we routinely accept the virtual reality of descriptions, narratives, and arguments within two-dimensional worlds.

In non-probative Inter-play, image and text do not offer a claim/proof relationship. Subsets within this part of the framework that use both Grouping and Bridging Ties include "*truthy*," *feely*, and *fantasy*. Subsets that only have Grouping Ties are *non sequitur* and *decorative*. In general, non sequitur Inter-play juxtaposes unrelated elements such as an asphalt shingle next to a recipe for potato soup.[11] Decorative Inter-play is close to the non sequitur, but it does not intend to baffle through its image/text relationship. The visual is there to set a mood rather than to create a connection with an aspect of the text.

In adding Bridging Ties, truthy Inter-play uses images that can make a statement easier to believe (Zhang, Newman, & Schwarz, 2021). "Cats breathe through their eyelids" paired with a picture of a kitten does not offer evidence but as Zhang et al. point out, does ease processing. There is more on this phenomenon later in the introduction. Feely Inter-play implies a belief or opinion that cannot be proven or disproven. In 1986, *U&lc*, a magazine that promoted ITC typefaces, created the first Herb Lubalin Design Competition. Students were inspired by Jonathan Schell's *The Fate of the Earth* (1982). Schell details the potential consequences of a nuclear holocaust. The design on the cover of *U&lc* for that issue used the title of the book set in a large Avant Garde Black. In a smaller point size, they quoted a section from the book that states:

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> In weighing the fate of the earth and, with it, our own fate, we stand before a mystery, and in tampering with the earth we tamper with a mystery. We are in deep ignorance. Our ignorance should dispose us to wonder, our wonder should make us humble, our humility should inspire us to reverence and caution, and our reverence and caution should lead us to act without delay to withdraw the threat we now pose to the earth and to ourselves.
>
> —From *The Fate of the Earth* by Jonathan Schell

The words of the title are stacked so that T**H**E is on the first line, F**A**TE on the second, OF **T**HE on the third, and **E**ARTH on the fourth. The highlighted letters you see in each word stack vertically to form the word HATE set in a different typeface. This dystopian speculation presented through a typographic change that attracts the eye is chilling and worth considering. But it is not one we can examine and conclude that the proposition is likely true. In the presence of the text, forgone conclusions are not in evidence. Many outcomes are possible.

The subset, fantasy Inter-play, creates a character in an environment that if human, is larger than life, or if not, has human qualities. The Coca-Cola polar bear holding a bottle paired with the words "Always Cool" creates a curated world confined to the campaign. These associations can have strong negatives as Joe Camel proves. Smokey the Bear, on the other hand, is there to help. What he says is factual, but he is not an authority. He's a fantasy whose advice we trust. Smokey the Bear suggests the potential for some categories to overlap. A bear can't be interrogated, but the nonprobative fantasy presents certain facts that can be.

On the other side of the aisle is *probative Inter-play* that includes *reinforcing* Inter-play and *complementary meaning*. With few exceptions, this book's examples focus on complementary meaning, which challenges, contradicts, or clarifies default meaning for an intended group. Reinforcing Inter-play supports a community's default understanding or like Barthes's relay, ties the speaker to the speech in cartoons and graphic novels. Because audience histories and interests vary, the classifications, reinforcing Inter-play and complementary meaning become somewhat fluid depending on what an audience, community, or stakeholder knows and believes. For example, a novice stuck on the side of the road will find an image of a tire jack with text on how to change the tire, clarifying. But for an expert mechanic, the image merely reinforces internal understanding. This fluidity is not surprising. Design, UX/UI, and rhetoric have long addressed changing stakeholder

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interests, which this book similarly values. Queiroz and Merrell's (2006) exploration of meaning found that even its potential alters over time: "meaning must be non-linearly applied, and change must be allowed" (p. 58). Time suggests that meaning is not as fixed as we might assume.

When image with text simply confirms what an audience already believes, reinforcing Inter-play forms. A sign outside a coffee shop with a stock photo of a cup containing steaming coffee and the words "Coffee Here" references a generic view though someone learning English might find the image illuminating. Adding the text "Andy Anderson, @manmakecoffee says 'this is some of the best coffee I've ever had!'" incorporates a significant influencer whose online presence is a bit larger than life adding fantasy to reinforcement. Fantasy can add authority if Andy has proven his bona fides.

### Complementary Meaning: Addressing Inexperience and Bias

Exploring complementary meaning is the most important function of this book. In this framework, complementary meaning must be compositionally sound regardless of aesthetic to facilitate noticing and interpreting, or it will fall short of producing a type of Inter-play that clarifies, contradicts, or challenges ordinary understanding. As with other subsets of Inter-play, classifying any one example can be somewhat fluid because prior knowledge and assumptions are dynamic, depending on culture, geography, and time. I expect that over time some examples will no longer challenge their audiences but instead simply confirm what they easily imagine. I hope that will reflect human progress. Even in the here and now, what is a challenge for one audience will clarify understanding for others with different histories and interests. I think of these situated outcomes as a reminder to avoid self-referential design where I assume my beliefs map onto the majority.

In offering examples of complementary meaning, much of the work shown here addresses inexperience or bias linked to problematic imagining. Text alone invites personal imaging. Images alone invite personal languaging. And in that personal space, our inexperience and bias influence what we do. The problems built into imagining have important implications. From a research perspective, Sophie A. Nicholson-Cole (2005) studies how images might help communicate the impact of climate change. After interviewing participants across a range of socioeconomic characteristics, the author found that concrete visual information holds the potential to help people see what they do

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| Outcomes | Ties | Probative | Qualifying Criteria | Excluding Criteria |
|---|---|---|---|---|
| **Non-sequitur** | G | No | Resists associations | Creates shared associations |
| **Decorative** | G | No | Sets mood not meaning | Creates shared associations |
| **Truthy** | G/B | No | Eases processing | Offers proof, feely, fantasy |
| **Feely** | G/B | No | Cannot prove/disprove | Offers reasons, proof |
| **Fantasy** | G/B | No | Creates char., curated life | No fantasy character/setting |
| **Reinforcing** | G/B | Yes | Echoes common knowledge | Non-probative or new assoc. |
| **Comp. Meaning** | G/B | Yes | Clarify, contradict, challenge | Non-prob. or common assoc. |

**Figure I.2**
Inter-play: Characteristics of Probative and Non-probative Outcomes (S. Hagan). © 2022. G-only = Grouping Ties Only; G/B = Grouping and Bridging Ties

not imagine. She writes, "In general it appears that within this sample, people have great difficulty relating to climate change as having much personal relevance particularly in a practical sense" (p. 263). They cannot imagine and need concrete evidence that does not frighten (O'Neill & Nicholson-Cole, 2009) to help them see that relevance. This is intriguing. Multimodality is sometimes seen as the end of imagination and reflective thought, but it can actually provide a space for reflection and critical thought. Complementary meaning provides that space by narrowing problematic imagining, then encouraging new references and associations to live within existing contexts (Aitchison, 1994), giving more weight to the new idea through these functional differences. On a basic level, this form of Inter-play triggers, "I hadn't thought of it that way." Figure I.2 lists the probative and non-probative categories of Inter-play, the ties that bind them (Grouping alone or Grouping and Bridging Ties), and their including and excluding characteristics.

## The Framer: An Interdisciplinary Human

This framework does not live within any single discipline. Serendipitous curiosity linked to work I found compelling has formed my path. But it

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seemed to begin without planning as I became the offspring of an interdisciplinary upbringing between design and rhetoric. Seeking graduate study, I found a joint master's program between design and English that I believed (incorrectly) I could manipulate to suit my visual interests. I thought that focusing on text would only waste my precious two years. I was disabused of that notion when I began to understand that designs I admired because of their visual elegance were equally indebted to their textual components. A satisfying way of analyzing this work proved elusive in part because of my own knowledge gaps, inviting study as a doctoral student in rhetoric. While welcomed and accepted, with one foot in the visual and another about to be in the textual, I would never feel completely at home again. The breadth-over-depth specter that follows an interdisciplinary path has some validity, but only some. I am in awe of the laser-focused depth that lives within a discipline's canon. Even so, as my inquiry continued, I was aware of what Thomas Kuhn (1970) said about disciplines—they cannot solve all the problems put before them. I concluded that multimodal analysis is a case where not feeling at home is necessary so that the data can find new footholds when the canon cannot accommodate them. Though the fields we draw from are different, I agree with Steven Skaggs (2017) who similarly feels that theory in this arena needs to emerge from many fields.

With that in mind, it might be helpful to state the following. If you seek a book on typography, mine does not have that single focus. If you crave the pleasure of viewing the best design, you will have it, but these black and white reproductions might leave you longing. Some may want more electronic examples, others more posters. I do my best to offer an array of media, but I also understand if my selections don't fit your expectations. Where theoretical grounding is concerned, if the book you want emerges from semiotics, that is not where my work or my heart lies because the data did not take me there. Being inspired by Halliday and Hasan's (1976) theory on cohesion, which led to Bridging Ties, might suggest an alliance, but it is just one of many theories that help me do the job. I am indebted to Arnheim (1974) for the insights he brings to my table, but the Grouping Ties his work inspired veer away from his findings on *Perception in Art* and do not gift me with Gestaltist bona fides. Cohesion and unifiers join similarities but I needed Ties to group and bridge across differences. I am grateful to Paivio (1986, 2007) as well as other perspectives linked to dual codes (Baddeley, 2010), but no one would take me for a cognitive psychologist,

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nor would I want them to. I love to swim in the data of image/text/typeface relationships. I can't make sense of that data without outside scholarship, and they similarly can't create what an interdisciplinary head allows.

## References, Associations, and the Ongoing Conversation

This book hopes to be part of a rich, ongoing conversation that includes design, rhetoric and argumentation, and semiotics and social semiotics. There is much to learn from these perspectives. Meggs (1992) documented visual/verbal synergy early on. Ehses (1989) published his famous case study on visual rhetoric in the Macbeth poster at a time when interest was just beginning. Gries's (2015) work on materiality as part of a system of relationships brings multiple influences to the artifact that have enriched my thinking. *Argumentation* created a special issue, *Visual and Multimodal Argumentation,* that identified opportunities as well as constraints in this arena. In that issue, Blair (2015) takes a step into the probative potential for visual/verbal arguments, noting that he has, "been convinced, for example by Kjeldsen (2013), that images tend to convey information that cannot be exhaustively expressed in words" (p. 220). Feng and O'Halloran's (2012) study of cartoons from the United States and Japan identifies "inter-related systems of meaning" (p. 2067) that clarify their examples. Skaggs's careful development of theory in Firesigns (2017) illustrates the value of both rigorous inquiry and developing an approach through multiple disciplines. And these are only a few examples.

To this conversation I add that methods of analysis that fully satisfy visual/verbal environments must make a place for the assumption of complementary difference between image and text as part of the foundation. In other words, we must observe and even celebrate the structural and functional independence of those parts. Inter-play analysis in chapter 2 examines visual and textual elements through the lens of difference, embracing the unique strengths of the visual and textual; strengths I identify in chapter 1 as the *principle of relative certainty*. Relative certainty acknowledges and isolates the foundational areas where images communicate shared understanding better than text and where text communicates shared understanding better than images. While meaning is an elusive concept, we do manage to make sense to each other through these relative strengths. Using the principle of relative certainty, Inter-play analysis identifies what spatial

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relationships contribute, what words and their sequence contribute, and how each alters the meaning of the other. In Inter-play, each modality contributes information the other cannot,[12] which makes these collaborative environments good places to address certain sticky problems. But coming to agreement on how difference works is not an easy conversation.

## That Said . . .

Disciplinary sticking points will likely continue. Bateman says it well:

> "[T]exts" and "images" are generally addressed by very different groups of disciplines and those disciplines often take very different views both on just what they are describing and how descriptions should be pursued. This can be a source of considerable friction: when those working on language are seen as telling those who work on images how their object of enquiry is to be investigated, or those working on images make statements about language and its ability or inability to offer useful views on images. (2014, p. 5)

Consider an image of a simple cup. Add the words "locally roasted," and it seems to read "the coffee is locally roasted." But on closer inspection, the "liquid" looks more green than espresso. Isolate the words "locally roasted" and you might reference the memory of a recent party. The objects of inquiry contribute their own unique ways of knowing, making it harder to find shared ground when the image alters the language while the text narrows what's in the cup. Bateman's right. Friction is unavoidable even as individual disciplines add important disciplinary insights.

From a vantage point in rhetoric and argumentation, Fahnestock (2003) found that images can form sequences that share the textual quality of parallelism. A series of pictures of a developing embryo present a repeated structure with minimal change over time. As she points out, an image structure can follow a noun structure (i.e., image of the egg, image of the zygote, image of the fetus) rather than indiscriminately mixing nouns with adjectives and verbs (i.e., the egg, tiny zygote, adds a heartbeat). Kostelnick and Hassett (2003) identify social conventions where architects visually communicate with other trained groups by attaching specific language (references) to images that become symbols like topsoil and subsoil.

Political cartoons can contain so many symbolic features that words aren't necessary. Luojie, a political cartoonist working for the English-language *China Daily*, drew a message that, while not quotable (Olson,

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1994), conveys the gist in a cartoon titled "Spoiled" (2016). In it, Lady Liberty pushes a baby carriage down a path while an angry president squeezes a bottle so hard the milk shoots into her eyes. It is not much of a stretch to create references and associations that result in statements like "the USA elected an infant who hurts liberty." In this case, each element was selected for its ease of naming.

While references and associations point to connections that deserve a deep dive, opposing voices rightly complicate study. Patterson (2010) reminds us that images cannot convey propositions, cannot say that Texas was once an independent republic because no visual symbol or scene could briefly describe it. Pushing against that perspective, Roque (2015) notes that a subset of images offers arguments with that propositional quality but finds the set limited. Gries (2015) believed in the need for a broadened perspective leading to materiality, wherein the practice of explaining images through language was problematic. In exploring materiality, Gries considers the idea of "discourse conceived in its broadest sense" (p. 11). The keyword that bothers her is discourse. Recognizing the difficulty with that description, she notes, "I worry that speaking about images and pictures in terms of discourse places too much emphasis on signification and too little emphasis on materiality, transformation, and consequentiality" (pp. 11–12). Bateman in *Text and Image* (2014) offers an extended reflection on the problem: "[m]uch confusion can be avoided from the outset by explicitly distinguishing linguistic and non-linguistic influences on visual form and, moreover, recognizing that these can coexist" (p. 15). I agree with the distinction as well as the nuance.

Early on, Kinross (1986) bristled at problems arising from a viewing angle based on the language metaphor. When using linguistic features to explain images, Kinross notes, "it seems that such analogies can be no more than vague ones, and that they collapse as soon as one tries to work them out in any detail" (p. 193). Wysocki (2001) notes that visual elements bring significant differences to communication that texts cannot express. Triggs (2011) considers that the value in design artifacts lies in their "symbiotic" (p. 67) relationship between text, graphic forms, and images. Atwan (2005) similarly notices "convergences" between image and text, while Faigley, George, Palchik, and Selfe (2004) report the feeling of being "caught off-guard by the unexpected meaning which results from placing each word and object together" (p. 12). For Meggs (1992), that sense of being "caught

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off-guard" is visual/verbal synergy.[13] Skolos and Wedell (2006) think of text as a more explicit form of communication than images. But within that perspective, and with a focus on the poster, they note a partnership where "type and image work best when they complement each other" (p. 9). Each of these scholars finds value in the differences.

I offer Inter-play analysis and complementary differences to this conversation where image and text are independent but relate through references and associations. In the interest of all the things I do not know and cannot predict, I'll take a cue from Bateman on coexisting and an analogy from science. Just as physics teaches that electrons are particle and wave, image, text, and typeface interactions might have their own duality based on similarity and difference. As we continue in these two directions, all sides should remember what Thomas Kuhn (1970) observed, "No paradigm ever solves all the problems it defines" (p. 109). Neither should we expect to do so.

As Kuhn promised, we all run into barriers. Roland Barthes's (1964/1977) deep dive into connotation confused him as much as it illuminated his work. In "Rhetoric of the Image," Barthes's analysis of an advertising example identified such a long list of connotative meanings that he had to abandon the project, hoping another researcher would continue the study. Donis Dondis (1973) experienced overabundance within the language metaphor. While she created categories of images with distinctive features that illustrated common qualities, each category's boundaries could not be made specific enough to tame their many nuances and arrive at an agreed-upon set. While Barthes and Dondis experienced too much, Kress and Van Leeuwen (1996) have shared the frustration of too little. *Reading Images* begins to reveal what reading an image might be like. But their project so far has not taken hold, which might require an educational mandate on par with writing. I appreciate languaging perspectives that offer a deep dive into interpretive complexity, but I argue that they cannot account for effects that emerge because of differences. While a unified theory might arise in the future, at this time, particle and wave coexist albeit uneasily.

Taking all that into consideration, if you find value in exploring a framework capable of analyzing the visual/verbal effects that these best works reveal, this book will satisfy your curiosity and provide a lens to investigate your inventional challenges. I hope that you will take this framework and add the beautiful depth of your insights to it.

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### To Illustrate the Inter-play Point: "I Am Not a Tiger"

The word "I" assumes a *Homo sapiens* who uses language and has a level of control over their comings and goings. But even those basic assumptions are tentative. Consider that when David Copperfield writes "I was born" (Dickens, 2000), the author asks us to narrow the default meaning of "I" to a human infant who has yet to conquer language or independently exist. Default meaning, restricted to infants, is not a stretch. A more significant gap between "I" and its usual reference emerges in the World Wildlife Fund poster "I Am Not a Rug" (figure I.3). Here the word "I" ties to the image to offer an opportunity to reflect on our assumptions. Tigers have been historically exotic objects whose value links to physical attributes. We place them in our zoos and circuses and stuff them for our museums—and sometimes we use them to adorn our floors. They are here for us to admire in the forms we determine. That they are also powerful and frightening adds to the pretense that we should preserve their beauty while negating their danger. The portrait of this tiger, by itself, magnifies those object relationships, inviting multiple interpretations as individual histories, interests, assumptions, and biases lean toward the majestic, predatory, endangered, or decorative. The image without text does not require us to reconsider the moral quandary we should grapple with when once-live creatures lie motionless in front of a fireplace.

If we were to turn this design into a sentence, we might find that "I am a tiger, not a rug" forms a clear statement but could be interpreted as the product of a delusional narrator or a genre of inappropriate children's story. A text that commands "do not make tigers into rugs," does little to remove the tiger's object status. The text "I am not a rug" with no image allows the word "I" to default to a human reference. In that case, the interpretation of the subject complement "rug" (complements the first-person "I") becomes a metaphor for the feeling of being "walked upon." When "I" has a human reference, interpreting "I am not a rug" as a literal rug would be disturbing, and that is the genius of this design. When the literal interpretation of the word "rug" collaborates with a new reference for the word "I," the first person still maintains its human reference even as it invites the tiger into that space. Therefore, any "I" made into a rug is disturbing. The designer has narrowed the distance between us and them. What was acceptable when the tiger was an object is now challenged. A union of image

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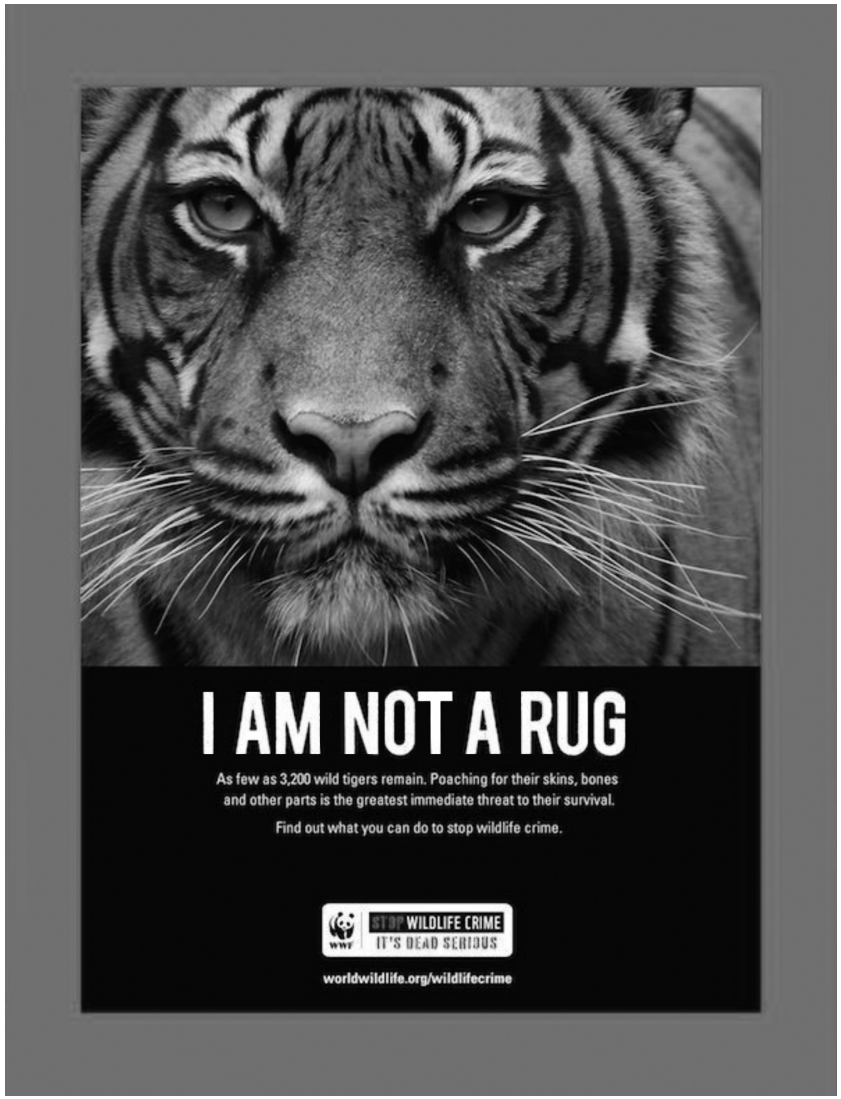
I AM NOT A RUG
As few as 3,200 wild tigers remain. Poaching for their skins, bones and other parts is the greatest immediate threat to their survival.
Find out what you can do to stop wildlife crime.
WWF
STOP WILDLIFE CRIME
IT'S DEAD SERIOUS
worldwildlife.org/wildlifecrime

**Figure I.3**
I Am Not a Rug. Poster (World Wildlife Fund). © 2016. Published under fair use.

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with new textual references demands reflection and adjustments to moral behavior. Re-referencing the word "I" to include animals is easier because words are slippery, often having multiple meanings because of limits to memory (Hopper & Closs Traugott, 2003). This slippery quality allows "I" to broaden from *Homo sapiens* to the Linnaean class Mammalia.

The power of this poster also lies in content selections. If that same photo paired with the command "do not make tigers into rugs," the power of the image would diminish as the tiger again became an object/victim under our control. From another side, if "I am not a rug" collaborated with a wide-angle image of a tiger hunting, the outcome might support the assumption that tigers are predators to be dominated.

The collaboration needs this visual editing. What E. H. Gombrich (1982) called the "selective code" (p. 147) results in imagined as well as concrete elements. "I am" invites us to imagine qualities of thought and agency. The adverb "not" is a difficult concept for an image to communicate. While showing "not" is possible when an object is cut out of a picture, the options are limited. Imagining absence is easier. But more critical imagining takes place within the subject complement "rug." Any actual image of a tiger made into a rug would reinforce the very outcome this poster tries to eliminate.

The simple statement "I am not a rug" with an image of a live tiger offers claim and proof not present in "I matter" or "I am worth saving." Either of those statements would diminish the tiger's portrait to "truthiness" (Zhang, Newman, & Schwarz, 2021) as the image can do nothing substantial to prove, "I matter." Similarly, "I am valuable to the ecosystem" might pander to self-preservation, but the image again fails to offer proof. In this poster, the tiger simply claims to be alive. The image is clear proof of that. It is probative Inter-play that challenges "tiger-as-object" assumptions.

Just as each word contributes intent that the image cannot offer, the image provides information that the text cannot. This tiger gazes back at us. James Elkins (1996), with a tip of his hat to Lacan, reflects on moments like these as: "I can see that I am seen, so each time I see, I also see myself being seen" (p. 70). The met gaze is powerful. Text could not provide a direct experience of the tiger's calm demeanor. The specific patterns in the animal's living fur and elegant stance offer a spatial experience with intimate details that challenge the tiger as an imagined living room accessory. The power of the image is also in the cropping. A view so close you can count the whiskers provides a more robust experience than that seen from a

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wide-angle landscape view cluttered with an environment that would steal attention from the subject. This specific set of spatial relationships does the job. That steady gaze is the most crucial proof that this animal does not have the qualities of a lifeless rug.

Finally, the typeface gives the statement sans serif condensed black emphasis. A smaller point size, a regular face, or lowercase letterforms would lose the shapes' Potency (Doyle & Bottomley, 2009). A serif face could create compositional conflict with image details, producing too many complicated shapes.

Image, text, and typeface make the case that this animal should not be an object for our amusement, suggesting a stronger tie to the qualities that tigers and humans share. These relationships are not easily forgotten because this direct experience now lives in a shared nest that expands the set of lifeforms not made into rugs. While it might anthropomorphize the animal, doing so reminds us of the needs we have in common. This example of complementary meaning challenges old ways of thinking and encourages an audience to lose a common reference point, which links the "tiger category" with the "rug outcome." New references prompt a move away from "this beautiful object would be perfect for the den" and toward "this being is alive—how do I feel about that?"

### Related Perspectives: Multimedia Learning and Knowledge Gaps

"I Am Not a Rug" shows that designers create this interaction without help from books like mine. Even so, explaining the working parts not only informs analysis and evaluation, it also deepens understanding that encourages further practice. Multimedia learning has been building these opportunities to fill knowledge gaps. The learning improvements found in text/image relationships have been well documented (Carney & Levin, 2002; Holsanova, Holmberg & Holmqvist, 2009; Jian, & Wu, 2015; Johnson & Mayer, 2012; Levin, Anglin, & Carney, 1987; Mayer, 2002, 2010). Findings that include placing images close to the relevant text (Mayer, 2002) improved learning whether users prefer visual or verbal information (Plass et al., 1998), pointing to the power of nondecorative relationships.

### Inter-play and Truthiness: The Non-Probative Image

Multimedia learning suggests images have probative value, and research on truthiness strengthens the claim that images are not simply the illusion of

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evidence (Zhang, Newman, & Schwarz, 2021). Truthiness, the feeling that a claim must be valid even if it is easily disproven, is reinforced through textual repetition, rhyming, and images. Just like repetition and rhyming, visual information increases the effect (Newman, Garry, Bernstein, Kantner, & Lindsay, 2012; Zhang, Newman, & Schwarz, 2021). A typical example is "turtles are deaf" next to an image of a turtle. Even though the image has no probative value, its presence increases the truthiness of the claim (Zhang et al., 2021). While the effect is apparent, there are two possible explanations. In the first, the image simply eases the way just as textual repetition or rhyming would do. That is called *processing fluency*. In the second, the mere presence of an image acts as evidence. That is called the *illusion of evidence*.

In their research, Zhang et al. (2021) found evidence of the first effect, processing fluency, but not the second, illusion of evidence.[14] Participants read comparative statements in one of two conditions: text alone and text with image. In the text-alone condition, there were two variations, the easy to imagine object and the hard to imagine object. Objects that are easy to imagine included pearls and wool. An easy to imagine comparative statement is, "Pearl will have increased more in price than Wool" (p. 4). The second variation contained items that were hard to imagine like betel and leghorn. That statement read, "Betel will have increased more in price than Leghorn" (p. 4). In this first condition there were only statements.

The text with image condition included the same easy to imagine and hard to imagine variations. In the first variation, an image of the easy to imagine pearl would pair with the statement "Pearl will have increased more in price than Wool." That statement did not include a picture of wool. If betel was the subject, "Betel will have increased more in price than Leghorn," included a picture of betel, but not an image of leghorn. In this variation, the image paired with the item that increased more.

In the second variation of the image condition, an image coupled with the noun at the end of the sentence. "Pearl will have increased more in price than Wool" would include a picture of wool next to the word "Wool" but no picture of pearl. The sentence "Betel will have increased more in price than Leghorn," included a picture of leghorn, but not an image of betel. In this variation, the image paired with the item that increased less.

Here is what the researchers were looking for. If images paired with a subject that had a greater increase in price also increased the sense of truthiness, the outcome would confirm processing fluency because it would ease acceptance of the comparison more than the no-photo option. In other

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words, the image with the subject would facilitate the flow. That easing happened. Fluency was even higher when the subject was harder to imagine.

The more critical discovery, especially for our purposes, concerned the illusion of evidence where an image would suggest evidence wherever it is placed. If that's the case an image of leghorn (a type of chicken) paired with the sentence, "Betel will have increased more in price than Leghorn" will result in disbelief because the image of leghorn would give the illusion of evidence to leghorn. In other words, if images always count as evidence, participants should doubt the claim about betel increasing more in price. If they doubt the claim, then a falsiness effect would negate processing fluency because the participant would have to work harder to doubt the claim. A significant falsiness effect did not happen. Zhang et al. (2021) state that "it [the image] did not influence judgment relative to a no-photo condition when the subject was expected to be difficult to imagine to begin with" (p. 8). Overall, an image in the second position did not increase a falsiness effect more than text alone. The authors state: "[R]esults are fully *consistent with a fluency account* [emphasis added] of truth judgment. As observed in numerous studies, claims are more likely to be accepted as true when incidental influences make them easier to process" (p. 8).[15] It bears repeating that images are not solitary contributors to fluency. Textual repetition, a valued tool of argument, also produces this effect.

It bears even more repeating that the authors did not observe an illusion of evidence effect. As a fluency effect, a tiger next to the words "I matter" encourages truthiness through processing fluency, not because it is an illusion of evidence. The image does not suggest evidence simply because of its placement with the text. The living animal next to the claim, "I am not a rug," is evidence that is *not* an illusion because the implied "I live" includes proof of life within the limitations of the medium. What makes "I Am Not a Rug" and other examples in this book so powerful is the opportunity for collaboration to offer evidence over mere fluency. In the case of the tiger, a probative relationship forms with the text. One can examine the relationship and find the proposition is more likely true than not.

## The Book

This book explains the roles that text, image, and typeface play, shows how the three tie together and explains why the outcomes surpass what image,

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text, or typeface could communicate independently. As Radley (1990) said, these objects have been transformed from "ordinary to special purposes" (p. 46). The transformation happens because of the interaction between them.

This book does not engage with genre, grammar across modalities, or modes. Kjeldsen (2015) notes in *Visual Argumentation* that "[t]he three most dominant genres of visual and multimodal argumentation . . . are arguably advertising, cartoons and scientific communication" (p. 120). While research finds value in genre, I argue that image/text/typeface interactions have potential that genre classifications cannot predict. Those classifications could hinder invention in this arena of communication.[16] I similarly do not focus on grammars across the image/text divide. A focus on grammar-like patterns can place too much weight on similarity perspectives over assumptions of difference. Modes, as considered in semiotics, are also outside my scope. While modes represent "material stuff" (Groarke, 2015), the concept has a too-close relationship to text. Gries (2015) identified a similar problem with the word "discourse." I share her concern with those "too close for comfort" elements.

## The Evidence

Developing this perspective emerged from the study of more than two hundred examples from professional and student designers working from the mid-1960s to the 2020s. As my focus on exemplars suggests, the compositions had to be fully realized textually and spatially. The work repeatedly showed an interaction in which image, text, and typeface tie together in loose to tight relationships to offer messages in which images and texts are equal contributors. I try to have no preferred aesthetic, looking instead for work that confronts prejudice, addresses a lack of knowledge, or makes the implicit explicit, resulting in a book that considers multiple topics rather than a corpus that would assess impact in one subject area.

Along with examples from electronic media, this book includes influential, provocative, mind-changing posters by some of the best designers in any place or at any time. Schools of design remind us a little too often that they have moved beyond "posters and toasters." I see that as an understandable but misplaced perspective, to which I would reply that design has created some of the world's most potent arguments in the form of the very posters we are supposed to now distance ourselves from; powerful ideas

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that cause people to reflect, to act, to feel. Posters are and should remain a part of the discipline that we value. They trigger passive attention, the interest that occurs when we are simply minding our own business. As such, they are part of larger projects from interaction to service design. To downplay the impact of posters through an *ad res* attack is to fall into the trap of logical fallacy. Minimizing significant contributions that brought Design to the dance in the first place should not be necessary to elevate Design in its other senses.

This book has three parts. *Part 1: Roles: Re-presentation with Re-articulation Create Meaning in Inter-play* explores Paivio's work on dual coding and its effect on the concept of meaning that I argue needs to loosen its grip on semantic/syntactic dominance. Using an altered perspective on meaning as a springboard, part I examines the rich meaning embedded in an example designed by Uwe Loesch, *Geschichte als Argument*. *Part II: Relationships: Binding Image, Text, and Typeface* introduces Grouping and Bridging Ties, the noticing and interpreting ties that must form between image, text, and typeface before loose to tight types of Inter-play emerge. Those loose to tight types result in non-probative and probative Inter-play. *Part III: Unions to Outcomes: Inter-play as Complementary Meaning, and an Untapped Opportunity* begins by focusing on the specific Grouping and Bridging Ties capable of forming the four loose to tight unions of Inter-play. Non-probative and reinforcing types of Inter-play, summarized in this introduction, are not explored in depth in this book. They deserve time and space of their own. Instead, the remaining chapters on Inter-play explore the probative type, complementary meaning, which invites new associations and references that challenge, clarify, or contradict default understanding. The last chapter speculates on sequences that weave imagined prior knowledge with concrete new information to make nuanced use of this communication form.

## Part I: Roles: Re-presentation with Re-articulation Create Meaning in Inter-play

### Chapter 1: "What Difference Do the Differences Make?"

Paivio's dual coding theory, summarized earlier in the introduction, is the ground I use to address W. J. T. Mitchell's (1995) query concerning text and image, "what difference do these differences . . . make" (p. 91). The

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differences uncovered by Paivio's theory of direct and indirect experience suggest that meaning is not simply forms of re-articulation. The unique nature of images and the role they play in experience encourages the concept of *re-presentation*, not from a derisive stance but an elevated one that identifies the image's unique meaning-making properties. Re-presentation suggests the image's area of *relative certainty*, a term I introduce that speaks to the meaning of spatial relationships, colors, textures, and visual dynamics. Text cannot communicate these spatial relationships with easy accuracy (Jackendoff & Landau, 1995). That is its area of relative uncertainty. The image cannot produce a reliable syntax to share statements, questions, and demands (Olson, 1994), its area of relative uncertainty. With these different strengths and limitations in mind, chapter 2 begins.

**Chapter 2: Inter-play Analysis in "Geschichte als Argument"**

Uwe Loesch's *Geschichte als Argument* (History as Argument) offers a window into inventional opportunities uncovered by the analytical method I introduce, Inter-play analysis, geared for examples of image, text, typeface interaction. This method is based on the principle of relative certainty introduced in chapter 1. By comparing Loesch's work to other possible inventional directions, the value of that designer's decisions becomes apparent. They include typeface selection and word choice that impacts image interpretation, and image decisions that produce evidence to alter the meaning of the text. While Loesch employs a realistic image, the chapter also touches on the value of distorted, simplified, and non-objective shapes as inventional opportunities.

**Part II: Relationships: Binding Image, Text, and Typeface**

**Prelude: The Value in Noticing**

Uniting image, text, and typeface through the Grouping and Bridging Ties is a system I began to consider in the early part of the century using different terms (Hagan, 2007). Both categories of ties are necessary. One set groups unlike structures and invites noticing, while the other bridges the two and invites synthesized interpretation. While both are necessary to the framework, the prelude stresses the value of noticing and the reasons it should not be minimized.

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**Chapter 3: Grouping Ties: Noticing Relationships Built on Difference**

This chapter considers how Grouping Ties bind the discrete units of text to the continuous form of images. There are three major sets of Grouping Ties with seven specific ties within those subcategories. Grouping Ties are inspired by Rudolf Arnheim's (1974) observations on images but his focus on similarities across shapes was never meant to account for a relationship between differences. To more fully illustrate why Arnheim's work inspires but cannot produce the Grouping Ties, the chapter begins with background information that differentiates the needs when uniting similarities versus tying differences.

**Chapter 4: Bridging Ties: Interpreting Connections between Independent Systems**

Bridging ties bind re-presentation (images) to re-articulation (text), inviting us to interpret the relationship between the two. Ten Bridging Ties live within five main categories. Bridging ties are inspired by Halliday and Hasan's work on *Cohesion in English* (1976) but cohesion was created to account for a single modality. We must depart from their textual scope to account for the differences between spatial and textual understanding. Bridging Ties explain how image, text, and typeface form relationships without rules to define the synthesis. The chapter opens with background on cohesion to better illustrate how cohesion inspires but is not the same as Bridging Ties. Further, unlike cohesion in text, which does not need a second tie, Bridging Ties must have Grouping Ties because there is no interpreting without first noticing the potential to interpret.

**Part III: Unions to Outcomes: Inter-play as Complementary Meaning, and an Untapped Opportunity**

**Chapter 5: Inter-play: Grouping and Bridging Ties Create Loose to Tight Unions**

Grouping and Bridging Ties produce four loose to tight unions of Inter-play. The types begin with the most common—symbol-bond Inter-play that creates the tightest relationship between the sound and sight of words. The loosest type of Inter-play is parallel-play that invites the audience to look and read at their own time and pace. A college brochure or a website page for current students often depends on this loose form to communicate

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a sense of place linked to what the college does explicitly. Unlike parallel-play's loose invitation to look and read, sequenced-play suggests that the move between text and image should happen at particular times in the reading and looking experience. An art history text is one obvious example. The fourth type is inter-weaving, which creates a tight relationship between a limited set of words and images to deliver a big picture message that an audience can capture quickly. Posters commonly include inter-weaving. This chapter presents examples of the types and explains how each incorporates specific combinations of ties. These structures give rise to all seven of the non-probative and probative categories that are summarized in the introduction. The rest of the book focuses on the most important probative type, complementary meaning.

### Chapter 6: Complementary Meaning: Clarifying, Contradicting, and Challenging

Inter-play is a set of loose to tight unions created when ties bind noticing and interpreting.[17] But Inter-play also points to the outcomes of these interactions, which fall into the subsets probative and non-probative Inter-play. Complementary meaning is a type of probative Inter-play in which meaning would change if one of the three elements were removed or altered, and where image and text form claim/proof relationships. Therefore, both the visual and the textual are critical to the message. Complementary meaning enriches understanding because re-presentation and re-articulation work together to offer new, more memorable references and associations. This chapter introduces complementary meaning's ability to clarify, contradict, or challenge ordinary meaning for a particular audience. An audience's initial set of beliefs and attitudes guide these inventional opportunities. Differences in audience assumptions suggest that one group might nod in appreciation as an idea is clarified, while another has a more challenging experience.

When complementary meaning clarifies, it has the effect of filling in knowledge gaps. Contradiction appears when the visual and textual elements express ironic outcomes. The image of a miserable woman with the text "I'm so happy" is one take on that irony. The last of the three, the challenge, encourages an audience to rethink long-held beliefs and consider new associations and references that emerge when what they see does not fit with what they read. If a picture of a Muslim woman elicits pity, the

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collaboration of image and text can provide evidence (not merely claim, which is truthy Inter-play) that calls the assumption into question.

### Chapter 7: Exploring "The Can't-or-Won't Conundrum": Weaving the Imagined with the Concrete

While most of this book deals with the effects of actual images and text on the screen or page, imagined images and text can add necessary prior knowledge to the design. This chapter considers the inventional opportunity of inviting problematic imagination for the purpose of confronting bias with countering textual or image information. Writers and designers have done this intuitively, providing objects for analysis. Sequenced-play is well-situated to embrace audience bias or lack of knowledge—what this book calls *the can't-or-won't conundrum*, which usually makes it harder to consider new perspectives. The audience can't imagine the new idea or simply won't contemplate it. The chapter explains why sequencing imagined bias with concrete challenges to that bias might help move an audience away from a lack of knowledge, incorrect definitions, causes, and problematic values that prevent solutions. It also might not pan out. But it is worth a try. While grounded in image, text, and typeface, this form also finds specific value in motion, sound—and silence.

## And So It Begins

The design theorist and critic Ken Friedman (2000) notes: "The goal is a full knowledge creation cycle that builds the field and all that practice in it. Practice tends to embody knowledge. Research tends to articulate knowledge. The knowledge creation cycle generates new knowledge through theorizing and reflection both" (p. 56).

In that cycle, a theme in this book concerns the need to articulate the value of communication elements for their rich differences and the opportunities that distinction holds. But as Friedman points out, the knowledge creation cycle depends on embodying articulated understanding. I hope this book is useful in both parts of the cycle and will yield future contributions. Chapter 1 begins that journey toward articulating knowledge.

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# I Roles: Re-presentation with Re-articulation Create Meaning in Inter-play

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# 1 "What Difference Do the Differences Make?"

> "[W]hy does it matter how words and images are juxtaposed, blended, or separated?"
>
> (Mitchell, 1995, p. 91)

In 1995, W. J. T. Mitchell asked this simple question, and he is still waiting on an answer. In the introduction, I suggested the answer lives in the complementary differences between image and text. In other words, it's the matter that matters, because spatial relationships, colors, and textures in images contribute different value than the statements, questions, and demands that join to them. In that complementary world, each alters the meaning of the other. One example of that push and pull is "I Am Not a Rug" from the introduction.

This chapter establishes the reasons for complementary effects that alter meaning and add evidence to argument. I build from two pillars: how our brains make sense of the world for ourselves (Paivio, 2007), leading to how we then use that understanding to make sense to others. These two pillars provide designers and others with the foundational building blocks needed for Inter-play analysis and practice.

Psychologists (Baddeley, 1992; Paivio, 1986, 2007; Schnotz & Wagner, 2018; Sweller, 2011) suggest our brains use words and images for different purposes. Allan Paivio's (1986, 2007) seminal work on dual coding posits that individuals *make sense of their own* experience through direct (often visual) and indirect (verbal) means. His theory elegantly explains how we make sense for ourselves through these systems. Dual coding informs the first pillar. That pillar shows why the direct and indirect systems are equally valuable.

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As for the second pillar, what we understand for ourselves, we communicate to others. It stands to reason that how we learn about the world would influence how we share what we know or believe.[1] Shared understanding is the heart of meaning. While this is an area of study that can consume a life, interdisciplinary perspectives have something to add. Examples of Inter-play suggest that meaning needs to move away from its semantic, word-focused roots, where images become merely another languaging option. Designers who must decide when to use images and when to use text are not served well by this conflation. It fosters redundancy and novelty instead of stakeholder-centered invention where image and text are complementary collaborators to critical thought. Smagorinsky (2001) speaks to the cultural nature of this active process, one that can represent archetypes as well as instances that complicate the conversation.

While we characterize meaning through the lens of text, text is not equipped to communicate the spatial relationships (Jackendoff & Landau, 1995), colors, and textures we depend upon. Even so, the way that images have found a place in the meaning conversation has involved putting on a proper "languaging" cloak before entering the room. Re-articulation is everything. I believe that is a blind spot that needs an outsider's point of view, a child in the crowd if you will, noting that the emperor is perhaps missing something. My argument begins with the first pillar: how we make sense to ourselves.

## Dual Coding Informs Design: How We Make Sense to Ourselves

Paivio's theory[2] on dual coding (1986, 2007) explains how we make use of the visual and the verbal to build our own awareness. While some question his conclusions (Schnotz & Wagner, 2018; Schüler, Arndt, & Scheiter, 2015), researchers continue to study problems through the lens of dual codes (Plass & Kalyuga, 2019; Ponari, Norbury, & Vigliocco, 2018; Weinstein, Madan, & Sumeracki, 2018). Baddeley (2010) offers a dual perspective on working memory that includes the subsystems, the visuo-spatial sketchpad and the phonological loop that work within a central executive system. From another angle, Sweller's (2011) work on cognitive load theory separates primary learning into modules where language acquisition is an unrelated process to learning to recognize faces. Bolstering that theory, Josef Parvizi and his collaborators (Parvizi, Jacques, Foster, Withoft, Rangarajan, Weiner, & Grill-Spector, 2012), proved that the fusiform gyrus (FG) of

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the brain are specialized for facial recognition. Schnotz and Wagner (2018), who disagree with aspects of Paivio's model, maintain that the mind works with images and text in unique ways. They state, "text and pictures are qualitatively different forms of representations that require different forms of cognitive processing and have different uses for different purposes" (p. 11). With this shared ground in mind, even if the future unveils new complexity, dual codes can help designers conceptualize how different forms and purposes fill communication needs.

As Paivio describes in *Mind and Its Evolution: A Dual Coding Theoretical Approach* (2007), dual coding begins with the assumption that knowledge comes through direct experience. In other words, we do not emerge from the womb understanding a concept like a conspiracy. Conspiracy is a linguistic abstraction, an indirect experience, better understood after watching a playground bully enlist their cohort to keep you from going down the slide. As memories grow, so does the complexity of our mental models, requiring ways to organize these interactions. Paivio argues this takes the form of "the cooperative activity of two functionally independent but interconnected systems" (p. 34). Paivio calls these two systems the nameless *imagens* of direct experience and the verbal *logogens* of indirect experience. These two ways of knowing are critical to making sense of the world. That they are functionally independent *and* interconnected is crucial information for designers. The process of design requires choosing which function to use, why to use it, and when the visual and the verbal need to interconnect. Done well, this is a complex task where designers must consider the limitations as well as the strengths embedded in each of these two codes.

Indirect experience, the logogens or verbal code, occasionally includes single words as its smallest unit. But more often, a logogen is longer—a stock phrase or a memorized poem, "anything that is remembered as a chunk" (p. 38). The logogen is not a repository for single words because they cannot account for the nature of experience, which requires both syntax (word order) and semantics (word choice). Consider a direct experience that will later be recounted through an indirect lens. If you don't know Arabic, hearing someone call out *yurjaa altawaquf* while walking into an intersection, will only be sound and sight until someone steps in front of you so that you live long enough to later learn the sounds of "kindly stop."

As "kindly stop" suggests, and Paivio finds, a logogen's units are *sequentially available for processing and must be sequentially processed* even in skimming and scanning. Word sequence in English is so critical that changing

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the order of words in a sentence while still using those exact words leads to drastic changes in meaning.[3] Altering "'the cat lies on the table and destroys the yarn,' to 'the cat lies on the yarn and destroys the table'" produces different effects on the owner of that table and how she will organize her subsequent experience with cats (Hagan, 2007). Our eyes follow the text's sequence in both daily and designed experience. This changes as we engage with the second system, the imagen, where sequential processing is less evident but also necessary.

Imagens include seeing, remembering what we've seen, and drawing.[4] Bound to direct experience, imagens also include physical and nonlanguage aural information. Images, which live within the imagen code, are *simultaneously available* for processing, making them unlike text. However, just like text, images *cannot be processed simultaneously*. In other words, we cannot see what an image contains all at once. While walking into a forest, we might feel like we see all the trees. But we don't, and that is the fault of foveal vision, which designers need to know because it affects how we construct the space between look and read.

### The Eye's Structure in Designed Experience

The eye's structural limitations prevent seeing everything in focus all at once (Paivio, 2007; Solso, 1994, 2003). We are stuck with retinas that have a single pinpoint area of clearest focus, the fovea. *Perceptual span*, an out-of-focus ocular gift, gathers useful but not detailed information (Rayner & Liversedge, 2004). Our eyes must dart quickly from one area to the next. The speed of those visual saccades diminishes our sense of sequence (Solso, 1994, 2003) but it is there nonetheless. Take a moment to direct your line of sight to this word: **sight**.

Did you notice that when you didn't move your eyes, much of what was above and below was not in focus? Try it again the next time you're shopping. If you look at a set of complicated objects situated between other complicated shapes, say dresses on a mannequin, only the thing you're focused on will be clear. Whether looking at images or reading a text, our eyes make quick saccades from one pinpoint element of focus to the next. With text, this is a directed, linear experience. With images, it is a selected, nonlinear, idiosyncratic spatial experience that can be somewhat directed through task-based looking (DeAngelus & Pelz, 2009; Yarbus, 1967). These two types of

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sequence profoundly affect the understanding we take away from images versus text. Structural difference leads to the functional differences that communication and interaction design use as inventive tools.

### Functionally Independent Ways of Knowing

In addition to their structural differences, there is a second unique property to keep in mind. Imagens and logogens are *functionally* independent. Paivio's (2007) claim might not seem to match your experience. If you bite into a crisp red fruit and say, "these Fuji apples are delicious!" the name of the apple feels fused to the object. But if you take a different mental journey, you might come to a different conclusion about how fused that link really is. You're driving to work on a busy road. If to arrive at point B from point A, you had to name every car, stop sign, pedestrian, or road surface to organize your experience and drive safely, your life of constant re-articulation would be exhausting. Your organizational nightmare would demand you name not only every single thing you saw but also how one object related to another. Without all that information, you might not be able to react as an animal ran into the road. You would need to label grass, asphalt, concrete, streetlight, and uh-oh, what is the distance from each of those to that Gordon Setter (?), and what if you can't figure out the breed in time before screaming, "use my right foot to push hard down on the 'disc brakes!'" (while not letting go of the "steering wheel"—wrapped in "leather"—and while you're at it, don't say "emergency!—brake!" by mistake). But you don't have to do any of that. You see it, as would your passengers, you all know what that direct experience means, and as the driver, you react to what you see. You share visual understanding. Now consider functional independence from the other side. Imagine if every word, even "abstraction," "just," or "therefore" had to trigger a corresponding image, or you could not organize that experience. The clutter of redundancy would produce a world of unintended "handicaps" like those worn in Vonnegut's "Harrison Bergeron" (1961).[5] But we don't have to wear such things to keep us equal or safe. You can see without saying, and you can say without seeing.

Imagens and logogens are not just theoretically separate kinds of experience. Mary Wheeler and Anne Treisman (2002) also saw this independence by comparing normal brains to those of brain-damaged participants: "Double dissociations found in dual-task performance by normal participants,

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in brain imaging studies, and in patients with selective lesions support the separation of working memory into separate visual and verbal components" (p. 48).

The brain scans identified functional independence. This functional independence is something that designers use to help them solve problems.

### Independent but with References and Associations

While these components are functionally and structurally different, the Fuji apple suggests the verbal and imagery systems do trigger each other. Relationships form between the two codes so that activity in one system can initiate activity in the other (Paivio, 1986, 2007). When these unique ways of knowing act *referentially*, words can connect to a related image (Holcomb, Kounios, Anderson, & West, 1999; Kousta, Vigliocco, Del Campo, Vinson, & Andrews, 2011; Paivio, 2007; Schwanenflugel, Harnishfeger & Stowe, 1988). Sometimes this relationship is concrete as when the word wheel triggers an image of your flat tire. But words like dignity can also reference an experience that links to emotions rather than objects (Kousta et al., 2011).

In addition to references, there are associations. When associative relationships form, the verbal and imagery systems trigger a mixture of related ideas. A case in point: I took my favorite soup ladle on a weekend trip so that I could use it to serve chili to my friends. Now that I'm back, when I bring it out for gatherings, I associate that ladle with everything we did that has nothing to do with chili. As organizational systems go, referential and associative links are often automatic. The utensil with curved lines made of polished steel now connects to journal entries about frosty mornings and friends playing Left, Right, Center.

References and associations might conjure up "associative meaning," an individual sense of knowing. In this book, I stay away from individual reflection as I find it muddies the waters concerning how images and text help us share ideas through Inter-play and complementary meaning. I limit the conversation to what is most relevant to these designs and the designers creating new work. With that in mind, Paivio's (2007) inward focus only partially informs how we then use that understanding to make sense to others. That is the second pillar. For design, the real value in functional and structural differences lies in the way they impact each other to invite critical

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thought. Creating the second pillar begins with how we currently account for shared understanding before considering an alternative viewpoint.

### In a World of Re-articulation . . .

Meaning as shared understanding is traditionally explored using linguistic tools (Davis, 2003; Halliday & Matthiessen, 1999; Lakoff & Johnson, 1980; Peirce, 1902; Putnam, 1975; Queiroz & Merrell, 2006; Saussure, 2012), which makes perfect sense when the object of study is words, phrases, and sentences. From that perspective, *The Stanford Encyclopedia of Philosophy* (Speaks, 2019) describes two core approaches to meaning: semantic theory, which focuses on what is possible to use, and *another* semantic theory—foundational theory—narrowing meaning to what a culture uses. One specific approach to meaning is Halliday and Matthiessen's (1999) systemic functional linguistics, which identifies interrelationships between vocabulary and grammar. Another, RST or Rhetorical Structure Theory (Mann, Matthiessen, & Thompson, 1992), identifies hierarchical relationships that signal the potential of a text to reveal the speaker's purpose. Queiroz and Merrell (2006) evaluated multiple perspectives, including Lakoff and Johnson's work on metaphor and Peirce's work on the sign. In each, text was the dominant object of study where the data drove the model's expression.

But the long-held assumption that meaning emerges from a linguistic process has turned a focus on data into a deductive outlook where any form of communication must prove its semantic bona fides. When it comes to images and this category, references and associations would logically suggest that language has a place. But I pause to ask, what are we to make of the spatial relationships, colors and textures that don't translate so well into verbal references and associations? I see a color and say that it is turquoise—but you might think it's teal. Two functionally independent ways of knowing cannot always be satisfactorily known in terms of the other. But we continue to try.

Rudolf Arnheim's work is one such attempt. When Arnheim, a champion of the visual, wrote *Art and Visual Perception* (1974), he identified features that are markers of functional independence including shape, unifiers, and balance. But in analysis, these structures became "texts" of prescribed intention. His findings echoed *Visual Thinking* (Arnheim, 1969), where he claimed we "translate" swirling visual thoughts into words. While true

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from the perspective of associations, it loses the functional and structural independence that suggests limits. Barthes (1964/1977) got stuck in a different swirling problem. Accepting that meaning lives under the umbrella of re-articulated thought, he went on to identify that quality as denotative and connotative messages in an advertising image. The interconnections made sense but, in the end, Barthes could not finish his project as the list of connotations grew beyond his control. Perhaps he proved the hypothesis "signification cannot exhaust the image's ineffable richness" (p. 152) thereby suggesting that images are weak transmitters of meaning. But that was not his argument. I would argue that by minimizing functional independence Barthes missed crucial contributions.

We continue to push image data into linguistic molds because references and associations offer the tantalizing hope that the model will work. But that functionally independent piece keeps getting in the way. Patterson (2010), who values images, identifies it (in the negative) when he points out that images lack the core patterns of reliable syntax-like qualities. Viewed from a different angle, this is not a deficit. It is a difference. It is the data. Paivio describes what Patterson identifies, noting that "images (and their counterpart imagens) vary continuously in shape, size and other properties whereas language units at any level are structurally discrete, differing from other units by distinct steps" (Paivio, 2007, p. 40). These structural differences have consequences that should not lead to the conclusion that "the image is felt to be weak in respect of meaning" (Barthes, 1964/1977, p. 33). A closer look shows why it's an apple and orange comparison that designers need to know to avoid the trap of designing for novelty and redundancy.

## Apples and Oranges

Images invite the viewer to engage in self-selected looking. Self-selected looking is the viewer's eye deciding where to look next. From a linguistic lens, self-selected looking is a poor substitute for text's *directed looking*. Directed looking is the need to view one word after the next in a normative sequence to understand intention. Text in English has reliable patterns where we can anticipate that every time a noun follows an action verb, it will be a direct object. In the construction, "he hit the tree," the verb "hit" will always act on the noun "tree." Replace the tree with a car or the lottery, or one hundred other nouns, and in English, every version will

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be subject, verb, direct object even when the sense of "hit" changes. For images to meet a similar expectation, we would need to find patterns that are similarly stable and straightforward to diagram.[6]

The question I ask myself is, do images that encourage self-selected looking contain the seeds of directed looking found in text, and should we prioritize that feature? Kress and Van Leeuwen (1996, 2020) argue for normative interpretations of image structures within social groups. I see why that would make sense, but from my viewing angle, I think that there is a problem hidden in that process. Linear, semantic/syntactic patterns provide the stability needed so that intention, change, and surprise can emerge within and across sentences without overwhelming the reader with novelty coming from every direction. But while patterns provide stability in language, and while certain normative interpretations emerge from shape and pattern, one simple example being a stop light, images surprise and delight through their novel structural arrangements, arrangements that have relationship guidelines rather than normative rules. This is not a deficit for images nor text. It is a functional and structural difference.

In text, a paragraph usually begins with its important topic sentence. It is a dominance feature readers depend on. In images, dominance features allow more spatial variation. A large shape, placed in any location, can suggest its importance, its dominance. But a small, isolated object can do the same thing. A small, isolated, complicated, dark-value object will visually diminish the large object. In images, you will struggle to find similarities that suggest a similar interpretation through placement. The center will have the power until a small, isolated shape on the left-hand side calls the center into question.

Patterson is right. Text-like repeatable patterns do not exist in most images. That would be incredibly boring. Images are structurally and functionally different. Where text has parts of speech and a way that they fit together, images have figure and ground in spatial compositions with relationship guidelines that prevent chaos and promote interesting and organized spaces that do what text cannot.

Arnheim (1983) reminds us that the center is different from the middle. To prove this point, the Impressionist artist Degas often placed large, dominant elements in unexpected areas. For example, in Degas's *The Parade* (1866–1868), horses and riders, likely familiar with the track, get ready for a race. They are positioned mainly to the right side, getting smaller as they are farther

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away. A crowd of the day's new attendees is on the left where the stands are. In this pastel, a horse with a rider in a bright red jacket is what Arnheim would call, "the center of a field of forces" (1983, p. 2) even though he is partially off the right side of the paper, leaving the true center as a subdominant feature.

Compositions like this capture new ways of altering intention. Especially within Inter-play, normative interpretations could interfere with that arena of invention—the slippery quality that allows the image to affect the meaning of the text and vice versa. While I take note of Kress and Van Leeuwen's insights and admire them, I'm also reminded that normative potential is socially bounded. Degas's work was heavily influenced by Japanese art, pushing against social expectations. The surprise of "where" triggered by outside influences has inventional potential that leaves me less willing to embrace normative potential.

This is a world of spatial relationships showing a time and place that no longer exists in a world of activity. What might be most important to remember at this juncture is that text cannot simulate this spatial meaning with any specificity (Jackendoff & Landau, 1995). I cannot get anything like those spatial relationships, colors, and textures from a text. If I want to know about the lives of the jockeys, I should read. If I want to see a moment in time, I should look. If I want to know how some aspect of a jockey's life impacted the moment I see, narrowing and altering the way I interpret it, I should design the space between look and read. We could teach a normative reading through positional grammars that reduce compositional variation. Perhaps the poets would still find a way. But sacrificing our natural inclination toward self-selected looking to enforce these standardized expectations might be like cutting Sampson's hair.

Jens E. Kjeldsen (2015b) recognizes the value of the photograph for its ability to create what he calls thick representations, to bring information out for notice. He partially describes these representations as "a full sense of an actual situation" (pp. 201–202). "[A] full sense of an actual situation" speaks to the structural and functional difference. But the assumption of language, one that goes beyond references and associations, gets in the way of difference because these representations must still become "both event and language system . . . the latter to see how pictures can work as a culturally coded language" (p. 202). Kjeldsen is right in that we cannot forget references and associations, but in tying the image so tightly to a language system, functional independence is diminished by language expectations.[7]

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## Apples and Oranges with References and Associations

That said, some linguistically grounded research on images successfully limits the scope to references and associations. Rather than making systemic claims, it stays within the boundaries of interconnections. Feng and O'Halloran's (2012) study of cartoons from the United States and Japan walks this fine line. They create an image-based lexico-grammar for a limited set of data where conventions influence outcomes. Part of their analysis describes emotion in drawn facial expressions. The authors are careful to note their findings should be used as a tool, not as a prescriptive. In other words, their model shouldn't force data into artificial molds. Within the features of their limited corpus, the codified expressions in this subset of cartoons suggest a world where icon has morphed into something closer to a symbol as brows wrinkle horizontally or vertically and eyes reference emotive archetypes when opened or closed. These features link to specific emotions. "She's happy." "He's angry." Their analysis works within the data they selected, where it is possible to discern limited pattern intent. Still, that perspective doesn't get us closer to an answer to Mitchell's question, "what difference do the differences make?" (p. 91), which requires a focus on functional independence and knowledge of the *complementary weaknesses* of image and text. With this added complexity, designers command their toolkit and how they use it.

## Functional Strengths: Image Search versus Textual Intent

Images and text have different strengths. Images make search easier (Schnotz & Wagner, 2018). Humans share an ability to separate a figure from its background and find contours that separate one object from another (Cavanagh, 2005; Solso, 2003). Text for its part, reveals intent. Texts' metadiscourse markers (e.g., "if we are to continue . . . ," "from the beginning . . . ," "this paper will prove . . .") are a way words reveal that intent. But that upside comes with a downside. As Schnotz and Wagner discovered, text's longer linear structure and discrete units impede the search for information, making textual information harder to find and share. Images for their part do not have metadiscourse features, making it more difficult to guess at intent. But searching for information in an image is easier and improves the speed of sharing. These differences between textual intent and image search

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suggest visual literacy is not a kind of reading. Instead, it is really a kind of enhanced search. If it is a deeper search, that is a different process than the distinct steps of reading and literacy. Eye fixations linked to text versus images, explained in the next section, add to this important distinction.

### Not Just What We Find, But How We Find It

In an early study, Just and Carpenter (1980) showed that participants fixate on just about every content word in sequence. Visual span can encourage "look back fixations" (Cauchard, Eyrolle, Cellier, & Hyona, 2010, p. 40) that help us use layout features in the text to aid recall, but this still takes place within a linear sequence that captures syntax. If a reader decides that a text is not relevant and ends the reading process (Redish, 1993), they are aware they have not read entirely. But with images, self-selected looking coupled with perceptual span (out of focus outside the pinpoint) can lead to the feeling of having seen it all even when we haven't. While equipment accuracy can vary (Feit, Williams, Toledo, Paradiso, Kulkarni, Kane, & Morris, 2017), eye tracking suggests incomplete looking. Individual eyes fixate, noticing some things and leaving others unconsidered (Buswell, 1935; Judd, Ehinger, Durand, & Torralba, 2009; Solso, 2003). There is a great degree of variation across viewers (Norton & Stark, 1971). While verbal suggestions change a self-selected sequence to one that is partially directed (DeAngelus & Pelz, 2009; Yarbus, 1967), looking remains incomplete compared to text.

Yarbus, in his famous experiment, reexamined by DeAngelus and Pelz,[8] asked a participant to view the painting *The Unexpected Visitor* and respond to prompts that produced different finished eye scans for each task. In the original experiment, the individual's initial "free" scan created a kind of triangle shape that moved between the visitor, the woman, and the chair her hand was on. But when asked to "estimate the family's material circumstances," the scan changed to a series of patches that fell on each of the people in the painting. Finally, when asked to "give the ages of the people," the scan changed again to a focus on faces rather than bodies.[9] While each of those scans revealed new areas of notice, none of them, not even the initial scan, resulted in a complete object-to-object look at the image, suggesting that a grammar of images that meets the textual expectation of looking at each piece of content (or at minimum, being self-aware that looking is incomplete) would be an uphill battle.[10] Incomplete looking

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is not just a natural outcome. As noted earlier, it seems to have advantages for search by prioritizing salience or individual interest over comprehensive looking. The complementary benefits offered between image and text suggest that those who disagree with linguistic models of meaning have a point, one that designers should take note of.

## Pushback on Linguistic Perspectives

The *MIT Encyclopedia of the Cognitive Sciences* (Wilson & Keil, 1999) points out that "many philosophers would at least concede that mental content is a more fundamental notion than linguistic meaning" (p. 162). Van de Hoven (2015) notes, "argumentation per se takes place in the mind" (p. 138). Consider this example of mental content. Smagorinsky (2001), recalls one participant who, to understand a story, made use of "the psychological tool of drawing" (p. 147). Smagorinsky refers to the images the participant drew as "articulations of his sense of the characters' relationships" (p. 148), but even with the articulation caveat, the example suggests that mental content is somewhat more than linguistic meaning. Kress and Van Leeuwen (1996) illustrate the value of spatial relationships in the vectors that form between people in transactions—looking becomes primary in a space where semantics cannot compete. Sadoski and Paivio (2013), even though focused on a theory of reading and writing, note that we actively pull meaning from "verbal and nonverbal situational contexts" (p. 49).

In a more fundamental way, Gries (2015) looks at the problem from a perspective based on materiality and finds the practice of explaining images (the material) through language (the immaterial) problematic. Discourse is a poor proxy when materials of all types live within and outside of the artifact, which impacts an argument and transforms it. For her, there is a dynamic system of relationships that images live within, affected by it while also impacting it.

Olson (1994), who studied text, suggests that grammars and syntax for images are elusive. His observations concerning the topic remind us that the order of words in English makes them quotable, ready to share over space and time as *statements, questions*, and *demands*. But images cannot create statements, questions, or demands. Olson explains the "picture writing" of the Ojibway, an aboriginal people of North America who claimed to use graphic elements to represent a story sequence. "Such scrolls could

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be interpreted only by the shaman and could be described in quite different ways depending on the narrator's purpose" (p. 70). Their methods did not codify an image interpretation. Far from it, they knowingly focused on changing needs. But does that mean images just aren't as good?

### Possibility, Actuality, Potential for Change

Images are not alone in the tendency toward ambiguity. For all of text's patterns and quotability, texts are in their own way elusive and evolving (Queiroz & Merrell, 2006), containing words with multiple senses (Hopper & Closs Traugott, 2003; Putnam, 1975). When Queiroz and Merrell compared theories of meaning, they concluded that the most important was a Peircean view in which language is not a suggestion of certainty but instead embedded in a process of becoming. Words have the potential to be actualized, but the moment is never truly stable. Language moves from possibility to actuality while acknowledging the potential for change as interpreters are impacted by new experience. As the authors point out, time is always a factor. Putnam (1975) expresses the difficulty of nailing down meaning when individual words, as simple as "rabbit" have so many senses.[11] Further, barring the use of meters and liters, language finds it impossible to communicate specific intentions in terms of shapes and spatial relationships. Perhaps the semantic gets too much credit.

### What Words Cannot Explain

As Kaufer and Butler (2000) note in their work on scenic description, language builds rich spatial worlds that provide individuals with opportunities to imagine. What this means is verbal worlds are filled with uncertainty. Uncertainty can be beautiful as Mendelsund (2014) wonders, "Is it that we imagine the most, or the most vividly, when an author is at his most elliptical or withholding?" (p. 30). In other words, hazy uncertainty can provide delicious outcomes, but hazy uncertainty does not lead to shared understanding. While some scenic description produces detailed imagery (Bergmann, Genç, Kohler, Singer, and Pearson, 2016), and some people can imagine more vividly from text than others (Dijkstra, Bosch, & van Gerven, 2017), imagined views created from a text are still not, how do I say it, "quotable." It is ironic that text is valued for its ability to communicate shared

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understanding while being celebrated for its inability to share understanding. It leads to the ultimate "have your cake and eat it too" moment. To flesh out this limitation, Jackendoff and Landau (1995) identified why the verbal struggles to create the visual.

Semantic limitations are apparent in the sentences "he was right next to me" or "the cat was on the table by the yarn." They are evocative but not specific. Syntax and semantics struggle when communicating spatial relationships, leaving room for many interpretations. Jackendoff and Landau point out that while we have many object words, English has a meager set of relationship words, numbering around 80 to 100 prepositions. The authors note that some verbs do a similar job but can be folded into those prepositions, leading again to vague interpretations. Their example clarifies the problem.

"In back of and behind, which share directionality, also differ in distance. A tree may be right behind (proximal), way behind (distal), or right in back of a house" (p. 114).

Even with the modifiers "way" and "right," where is "right behind?" Is it almost touching me, or is it within three or six or nine feet or meters? How easy is it to imagine three versus six? This limitation produces a gap between what the speaker intends and the audience sees, making it more difficult to share the world of direct experience through the lens of text.

But it's not just relationships *between* objects that reveal limitations. A word like cup can have many different shapes (Aitchison, 1994). And what Putnam (1975) found in the rabbit, Hopper and Closs Traugott (2003) explain by way of our limited memories, resulting in words' multiple meanings. An "argument" can be a civil disagreement, a rhetorical engagement, or a yelling match (e.g., "your father and I just had a little argument"). Becker (1991) notes that all languages fall short of communicating everything we need to say. Language may be quotable, but what we need to communicate is often more than text can handle. This problem has important implications linked to the problem of inexperience or bias.

Consider the intractable problem of using words to describe people, objects, or scenes that are foreign or in the minority, to an audience who cannot or will not grasp the text's intention because of inexperience or bias. The same point can be made with images. Consider the problem when an audience, suffering through the same inexperience or bias, imagines an intention linked to an image of something they don't know or like. In these cases, the complementary meaning offered by images with text can make

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critical contributions. In other words, the intentions provided by metadiscourse complement the search opportunities offered through spatial relationships. Neither can be fully explained by the analytical tools of the other because their complementing areas of uncertainty make that impossible. Uncertainty in meaning-making, where certainty is desired, opens a space to acknowledge that language has limits, while simultaneously giving images more credit for the areas of meaning that they complete. Images are more than shortened textual expressions that need to be tamed by becoming text-like. They have unique areas of relative certainty, which complement what language brings to the table. Deciding which qualities of relative certainty and uncertainty to select, can turn a design from mere novelty or redundancy into an opportunity for reflection.

## Meaning in Images: Spatial Relationships, Colors, Textures, and Visual Dynamics

The big-picture functions of semiotics—representational, interactive, and compositional—have much to offer, but we must tread carefully. Rhetorical Structure Theory (RST) signals a text's potential to reveal the speaker's purpose, but applying that theory to image/text relationships presents complications. As Taboada and Habel (2013) note, there is "the potential presence of multiple relations between a particular instance of depictive material and different parts of the text" (p. 85). They argue that these multiple relations from image to text suggest the need to reconsider RST's hierarchical structure as a method of analysis for multimodal documents. Kress and Van Leeuwen's *Reading Images* (1996) has not resulted in widespread normative change.

What might best serve designers is this. Of all the approaches to meaning initiated through a linguistic lens, the process of Peircean possibility to actuality to potential (Queiroz & Merrell, 2006) has the most promise because it can be separated from its language focus. It opens the door to complementing areas of certainty and uncertainty that invite useful collaboration. This fluidity can create a new path, one that stays solidly committed to image/text differences, because that is where the data take us.

For Olson, text's certainty lies in its ability to create statements, questions, and demands. This is re-articulation. Images lack the syntax to communicate a demand versus a question. But in image meaning relative certainty

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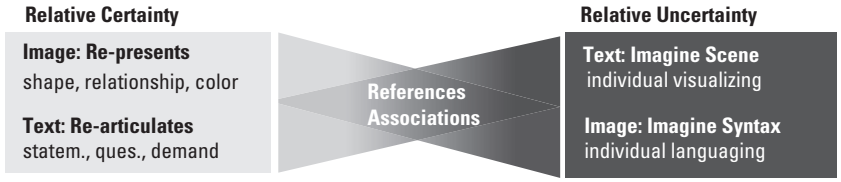


**Figure 1.1**
The Principle of Relative Certainty (S. Hagan). © 2022

becomes apparent in the shapes and spatial relationships of objects in an environment. This is re-presentation, a term Barthes (1964/1977) once referenced to explain why many dismissed the image's potential for meaning. I would like to challenge that connotation. Re-presentation is just as important as re-articulation because words lack the ability to re-present the specifics of shape and spatial relationships. In both visual and textual worlds, imagining can be a glorious ride, but when an audience cannot or will not imagine along hoped-for lines, a speaker's intention may not be the received meaning (Grice, 1969).

In images, shapes show their specific angles and textures. Spatial relationships tell us how safe the cat is when the cat is by the candle. IKEA visual instructions are sequence. But they are also proof that the "what and where" of images offer a level of certainty or all those Baggebos and Billys would still be in their boxes. Of course, a confusing angle in a photograph creates disconnects. But within the realm of complementary meaning, two structurally and functionally distinct systems benefit from each other. They each have levels of relative certainty and uncertainty, shown in figure 1.1, as complementary differences that give both images and text an important and unique seat at the meaning-making table.

Look at an image in any order and for all intents and purposes, you will not disrupt that image's shapes, spatial relationships, colors, and textures.[12] What and where stay steady, ready to be shared across time and space. Flower and Hayes (1984), who studied and valued text, called the spatial information that individuals know but cannot verbalize one of the "multiple representations of knowledge" (p. 120). They pointed out that individuals often represent the world using spatial "maps" that allow them to navigate from one place to another, maps they find almost impossible to translate into linear text.

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Analyzing shape-relationships within an image emerges through a reworking of the parts Arnheim (1974) identified.[13] These include contrast that reveals dominant features, unifying elements including similar shape, proximity, and alignment, negative space shape, and visual dynamics that convey a sense of calm or energy. Color can provide contrast or enhance unifiers and includes cultural aspects of meaning. Overlapping elements increase depth. These roles play out whether the image is representational with objects we know or abstract with objects that we have never seen. To adapt Queiroz and Merrell, these parts are *possibilities* that become actualities. This is the lens of re-presentation, not as a mere "resurrection" (Barthes, 1964/1977, p. 33) but as reframed shared mental content.

The psychologists Pearson and Kosslyn (2015) suggest four reasons why visual imagery has value in mental representation. Imagery respects our wiring because neural activity correlates to retinal activity. Imagery is useful for memory. It helps us reason by simulating. It bridges gaps between propositional and depictive thinking. But if you still think that text can do anything images can do, consider James Agee's frustration in trying to communicate a sharecropper's bedroom.

## A Case for Relative Certainty

James Agee's spatial descriptions in *Let Us Now Praise Famous Men* (Agee & Evans, 1941), illuminate a textual limitation. In writing that book, Agee was inspired by his love for the sharecroppers of Tennessee, where he'd spent part of his childhood (Finnegan, 2003; Gidley, 2010; Heitman, 2012). He hoped to take the reader so close to a sharecropper's lived experience that those readers could only imagine in the specific way that would make imagining close to seeing. While much of the story is about how it felt to live that life, Agee devoted 163 pages to writing about the specifics of how it looked.

Here he describes one of the rooms.

> There are two beds here, both three-quarter size, set parallel, their heads near the rear wall, their sides near the two side walls. One is directly opposite this partition wall, faces the closed rear shutter down the bare aisle of transverse planks between them: and the two of them together almost fill their side of the room. (p. 170)

Despite Agee's devotion and his mastery of words, spatial details overwhelm instead of enlighten. How far is "directly opposite" from "between

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**Figure 1.2**
Part of the bedroom (Artist: Walker Evans). *Let Us Now Praise Famous Men*, © 1935 or 1936. *Source*: Library of Congress Prints and Photographs Division Washington, DC 20540 USA.

them"? Agee speaks plainly, but language's inability to both accurately and easily represent spatial relationships (Jackendoff & Landau, 1996) means that most readers will not be able or willing to reconstruct a space through the clues provided. This is not fully Agee's fault. His coauthor, the photographer Walker Evans, played a role. James Curtis (1989) writes: "Evans believed his photographs were self-explanatory; the presence of words implied that the image was somehow deficient" (p. 28). The Agee/Walker book positions all the images in the first pages, separated from the text that refers to them. Evans's photograph (figure 1.2) immediately shows the space that sharecroppers were forced to live in. Had Agee added details about the roughhewn wood and the flies on the bed, he would have bogged down his descriptions even more. Lehtimäki (2010) views Agee and Evans as *knowing failures* in their attempt to represent "reality." He argues that in that failure, new achievement emerges. Certainly, Agee knew he had a difficult task ahead of him.

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Text struggles to re-present direct experience. Imagining the scene correctly is difficult when a reader has no context to fall back on. Readers of Agee and Evans's book could not accurately imagine what life was like for people who lacked the resources to improve their circumstances. Visualizing (i.e., imagining) using Agee's text does not equal the visual (i.e., the image) (Rose, 2012) of Evans's photograph.

In Walker Evans's photo (figure 1.2), a re-framing through re-presentation emerges from the shape-relationship principles that Arnheim identified. The relationships between the three main shapes—the mainly white object, the ground, and the back partition—create more certainty concerning how one shape relates to another. The bed stands out in contrast to the dark room. The contrast between the light bed and the dark background invites but does not demand that we look at the bed first. The unifiers include planks that repeat and echo the distance between the iron posts of the headboard and footboard in front of them. Visual dynamics, the tension that comes from feeling the three-dimensional world on the two-dimensional screen or page, reinforce the sense of a calm organized space in the shallow depth of the room. The negative space shape surrounds the beds where floor and wallboards act as the environment for the furniture. A woodworker might spend more time looking at how the room was made, while a social worker might linger on the unfair living situation evidenced by the flies. While personal histories and interests will affect what a viewer notices and when (Müller, Kappas, & Olk, 2012; Solso, 1994, 2003),[14] the spatial relationships will remain stable regardless of viewing order.

In this image, the bed's angle does not match Agee's description, but the adjustment reveals re-framing rather than hides re-presentation. Had the bed been photographed straight on, the bedframe might have looked more like prison bars as foreshortening created a false connection between the headboard and the footboard. Adjusted re-presentation invites the audience to comprehend another's lived experience. The possibilities or choices that Evans had to consider become the actuality of the photograph, which later morphs from photojournalism to Library of Congress history—the next actuality.

Social, cultural, and personal judgments impact the experience of seeing that room. In the viewing, uncertainty continues. Why did they have to live like this? Speculation can be an intriguing ride, but it is a ride marred by our own bias and inexperience. Most of Agee's readers knew nothing of

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the sharecroppers' lives. Evans's photographs offer part of that knowledge through visual relationships. But even though Evans shows a kind of nobility mixed with poverty that cannot easily be imagined, what he cannot show is why these folks would live like this. What about the great American bootstrap and our ability to pull ourselves up by it? Agee fills this uncertainty gap when he tells us more about the sharecropper's daily life picking cotton and we learn, "all the endurance you can draw up against it from the roots of your existence will be thoroughly used up to fuel it" (p. 338).

In light of these complementary contributions, the old maxim that "you can't know it unless you can say it" does not hold. We can *never* fully say what we know because language does not provide the words for us to do it. To get closer, we need both re-articulation and re-presentation to complement each other, filling in areas that the other cannot touch. This complementing feature could be critical when addressing inexperience and bias, as the example of Abu Ghraib suggests.

Consider the assumption that Americans do not torture prisoners of war. Abu Ghraib would disabuse us of that notion, but when that news first broke, the textual description did not produce the necessary visual imagination. As Philip Taubman of the *New York Times* pointed out, "We didn't do our job with this until the photographs appeared on CBS . . . the televised images put the story into play" (Ricchiardi, 2004). Ricchiardi tells us that Sy Hersh's reporting kept the story going. But Americans only paid attention when we could see as well as read about what we would not imagine even when the words seemed to tell us all we needed to know. Images with the text impacted inexperience and bias, denial and problematic imagining, by providing the necessary spatial relationships that made the argument complete.

In cases where lack of knowledge (Carney & Levin, 2002; Johnson & Mayer, 2012; Levin, Anglin, & Carney, 1987; Mayer, 2002, 2010) or bias (Gries, 2015; Hagan, 2007) exists, the long history of re-articulation's dominance should no longer impact re-presentation's value. We must focus on the modality that serves the situation more effectively, leaving behind an overreliance on re-articulation that undermines our ability to analyze, create, and refine Inter-play, particularly in the form of complementary meaning. Recall the work of Nicholson-Cole (2005) in the introduction that suggests the need to include images in addressing climate change—the Inter-play of images and text encourages us to complete the argument.

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### Anchoring References and Associations as a Two-Way Street

Barthes (1964/1977) has called the text a one-directional anchor that narrows the meaning of the image (relays accounting for the relationship between dialogue and character). But these anchors, in the form of references and associations, are a two-way street. As "I Am Not a Rug" from the introduction suggests, images also alter the meaning of text. The "I" that is human becomes the "I" of the tiger. That images would anchor the meaning of text runs afoul of Barthes's definition, often "proven" by the classic example of a head and shoulders photograph repeated three times with three different captions. In the first, the person might be labeled "the mayor." In the next, "a convicted felon." In the third, "a Rhodes scholar." Each change in text narrows and directs visual focus. Words do the heavy lifting, changing that image from honored dinner guest to a potential "911 call." But the tables can turn.

Consider three versions of "Our Mayor" (figure 1.3). While the words "Our Mayor" stay the same, the meaning of those words changes because of differences in what you see. While words do alter image interpretation, images also change our interpretation of slippery words. This two-way anchoring is at the heart of Inter-play.

**Figure 1.3**
Our mayor (S. Hagan). © 2021. "10070030" by moodboardphotography; "Crying Cabbage" by rumpleteaser "Mud Fest 2008" by Hypnotica Studios Infinite are CC BY 2.0.

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## Moving On

Images communicate spatial relationships, colors and textures, which text cannot with any specificity just as text communicates statements, questions, and demands, which images cannot with any regularity. With representation and re-articulation as equals, and with images anchoring text just as text anchors the image, the next chapter examines one exemplar to address questions concerning the inventional decisions that lead to complementary meaning. In using this example, I follow the tradition of Barthes, who considered one work to address many questions. While Barthes chose his example for its visual and textual intentionality, I selected my exemplar for its excellence in developing every word, image element, and placement as a complementary feature to explore a problem linked to definition and value. The exemplar is Uwe Loesch's *Geschichte als Argument* (History as Argument)[15] in which details as small as a preposition and a spot of color make critical contributions. Its raw materials tie together to alter the ordinary meaning of the image and the text in ways that encourage reflection. After its release at an academic conference, it was introduced to the world in *Eye* (1997). Richard Hollis profiled the work and Loesch's approach to it. From the beginning, I was fascinated. Loesch's work changed the way I valued the text's inclusion in what I had thought of as a visual arena. Seeing that neither image nor text played the dominant role in the argument changed everything. The analysis of his design and the work itself, guides the rest of the journey.

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**Figure 2.1**
Konferenz-Cover für "Geschichte als Argument" (Designer: Uwe Loesch). 1996 Nachdruck mit Genehmigung.

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# 2 Inter-play Analysis in "Geschichte als Argument"

Seeing how the differences do make a difference.

Designers make difficult decisions linked to the principle of relative certainty (chapter 1). They decide which spatial relationships should collaborate with statements, questions, and demands and vice versa. Their choices are rooted in the independent and interconnected contributions that image and text offer. We should understand the implications of those choices so that narratives, descriptions, and arguments created as Inter-play can be informative and compelling.

In "Geschichte als Argument" (History as Argument) Uwe Loesch grappled with those decisions (figure 2.1). The resulting weave of direct visual and indirect textual experience as destroyed shapes and words added meaning that was not available when these elements were whole. Their complementary meaning triggers critical thought because claim with evidence—within the constraints of the medium—can be examined and found more (or less) likely to be true.

In the service of that reflective experience, Loesch develops every word, image element, and placement to explore a concept's definition and value. We are invited to think more carefully about Geschichte/history and what it means to have the "facts." Loesch mined the raw materials and turned them into an experience with nuanced potential depending on an audience's histories, interests, and assumptions. This chapter will introduce *Inter-play analysis* to explain how complementary meaning emerges when every word is the right word, down to the smallest element of language; when spatial relationships, colors, textures, and visual dynamics provide reframed direct experience; and when typeface gives an appropriate balance

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to its photon and phoneme contribution. In this tight form of probative Inter-play, the image affects the meaning of the words, the words narrow the interpretations of the image, and the typeface acts on both. "Geschichte als Argument" is a material answer to Mitchell's question, "what difference do the differences make" (1995, p. 91).

## Background

It is fair to wonder why a book that emphasizes English should devote a chapter to a design done in German. The problem of German language cases would seem to get in the way. In English, word order determines aspects of meaning. Direct objects must come after the action verbs that act upon them. When "the cat destroys the yarn by the table," the yarn is worse for wear while the table takes cover behind the preposition. But in German, four cases—nominative, accusative, dative, and genitive—express subject, direct object, indirect object, and possession, respectively. Because the cases determine intention, word order can change while meaning remains stable (Richards, n.d.). Luckily, this text is limited to a noun, a preposition, and a modifier (nominalization). Therefore, cases are not a critical part of the discussion, allowing deeper study of the raw materials that still align with English interests.

Deutscher Historikertag (the German Historical Association), a liberal arts congress, commissioned Loesch to design the proceedings' cover for their academic conference, held every two years. While his final design was intended for an audience of expert historians who gathered almost three decades ago, the inventive power of this work has turned it into an object of study (Hollis, 1997; Skolos & Wedell, 2006), encouraging a broader analysis for a general audience. Like others before me, I do not focus on the original audience but do consider some of the events surrounding that time, which influenced how Loesch used materials to address a problem that is so deeply rooted in human behavior its message remains relevant beyond its timely invention. At the end of the day, it is this design, not the time it was made nor the person who made it, which offers an opportunity for Inter-play analysis. With that in mind, this chapter will present a method that reveals why removing or altering any of the independent and interconnected elements of this design would diminish the whole.

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## Inter-play Analysis: A Seven-Part Process

The principle of relative certainty, defined in chapter 1, invites an analytical approach that reflects a focus on the value of difference. As chapter 1 revealed, image meaning is relatively certain in its spatial relationships, colors, textures, and visual dynamics, but relatively uncertain in areas of semantics and syntax. Textual meaning is relatively certain in the syntax that produces statements, questions, and demands, but relatively uncertain in its ability to communicate the spatial relationships, colors, textures, and visual dynamics of people and scenes. The many senses that individual words contain ("rabbit" was Putnam's example) extend Inter-play's opportunities. Areas of relative uncertainty are those that trigger individual imagination. Individual imagination is not a negative. Designers and writers often make use of it. But inviting imagination when it is not part of a larger strategy (see chapter 7), can reinforce bias and prolong inexperience.[1]

Inter-play analysis explores the potential within this continuum and has seven stages:

1. Document the parts. Because image, text, and typeface can be tightly interconnected, the first step in identifying their functional independence is to separate image from text, and text from typeface, which begins to bring their areas of relative certainty and uncertainty into focus. Text's words, phrases, or statements, questions, and demands can communicate umbrella abstractions or reference concrete objects that spark visual imagination. Visual information's spatial relationships, colors, textures, and visual dynamics invite object experience or form references and associations to an imagined story. Typeface shape will act on words in ways that might be rugged, pleasant, or active (Doyle & Bottomley, 2009). Look for redundancies across elements that might undermine collaborative potential.
2. Analyze the parts. A lexical/syntactic analysis on major aspects of the text reveals what each part of speech contributes. An EPA (Doyle & Bottomley, 2009) analysis on typeface reveals meaningful contributions in those shapes. An object/purpose analysis on images reveals the contribution shape offers the message. Some may feel object/purpose is a synonym for signifiers, a way of languaging. While objects have names, the functionally independent object communicates re-framed re-presentation

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and doesn't have to be named to act on the text. Object/purpose should place priority on the arena of relative certainty, which are its spatial relationships, colors, textures, and visual dynamics.

3. Determine the Grouping and Bridging Ties. Because chapters 3, 4, and 5 deal with Grouping and Bridging Ties and the loose to tight types of unions, this chapter does not include those parts.
4. Determine the union type. Identify the loose to tight type of Inter-play created (see chapter 5).
5. Identify the altering effects and their purpose. In this part of the analysis, I use two tools of argument, stasis theory[2] and the commonplaces, to determine the problem Loesch identifies and its significance. Stasis and the commonplaces are useful because they do not require that we translate images into text, maintaining the principle of relative certainty. While Loesch's work offers an argument, designs live as narratives, descriptions, arguments, or hybrid offerings that invite different disciplinary perspectives.
6. Explain the Inter-play outcomes. Is it probative or non-probative? Depending on the larger category, which subset does it fit and why?
7. Evaluate the pre-task experience, in other words, the composition. Is it interesting and organized regardless of aesthetic. The quality of the initial experience influences engagement and reflection on the content.

As noted, stage 5, identifying the purpose behind the altering effects, opens analysis to multiple perspectives. As Inter-play analysis explores descriptive and narrative opportunities, including genres yet to be discovered, stage 5 must similarly expand. I believe that researchers in semiotics and social semiotics, feminist theory, discourse analysis, compositional analysis, digital humanities, and cultural analytics will bring important insights adapted to a world of functional and structural difference within the principle of relative certainty.

### Documenting the Parts: Relative Certainty in the Text

The title by itself, "Geschichte als Argument" (History as Argument), suggests ongoing discussion as part of its extended definition. The remainder of the text links the conference to where it will be held and when it will take place, situating the experience. The information linked to time and

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place adds practicalities that trigger some imagination of building and season. While that information is important to attendees, it is a less dominant aspect of the argument. (However, as this exploration continues, the lesser information reminds us that any moment can seem to disappear.)

Geschichte als Argument
(History as Argument)
41 Deutscher Historikertag München
(41st Congress of German Historians)
17. bis 20. September 1996
(September 17 to 20, 1996)
Ludwig-Maximilians Universität
(Ludwig-Maximilian University)

### Documenting the Parts: Relative Certainty in the Typeface

The typeface is Helvetica Neue Condensed Black, which one could classify as Potent (Doyle & Bottomley, 2009). While a typeface's job is to re-present words, Doyle and Bottomley found that certain typeface shapes impact the meaning of words more than the words affected the interpretations of the face. In other words, a small, dainty Garamond Geschichte will not have the quality of strength found in a brutish **Helvetica Condensed Black**. The word "history" does not in and of itself communicate Potency. It is the typeface acting on the word that does the job.

### Documenting the Parts: Relative Certainty in the Image

The image is shredded paper where dark value and texture put visual weight on the left side, but the red color (grey text in figure 2.1) shifts the balance to the right. Visual dynamics play an important role here as a quality of disorder and chaos, a rush to get it done. In looking further for relative certainty, purposes from sinister to celebration could be under consideration, but the heavier weight of this paper is revealing. Paper used for a conference cover makes it an object that has shifted from "ordinary to special purposes" (Radley, 1990, p. 46) and in that shift, a shared frame of reference begins to emerge. That frame is reinforced in the texture of the object

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shredded. When cut, this paper does not curl up around itself. Paper with that kind of weight suggests a stock meant to last and be available for more than one season. The shredded paper also reveals remnants of letterforms, visually attaching it to the conference.

### Analyze the Parts: Language

Academic conferences create environments that are both curious and critical. The dialogues that take place within them can be made provocative by the arguments that precede them. "Geschichte als Argument," the title that preceded this conference, is not a neutral phrase. It hints at discussions rooted in definition. Is history the facts in context or a form of persuasion? But the most important word in this phrase is neither "Geschichte" nor "Argument." The seed for provocation lies in the preposition "als." Those three letters initiate the textual aspect of Loesch's inventive space.

Comparing the 1994 and 1996 conference titles illuminates the impact of small word choices. The earlier conference was "Lebenswelt und Wissenschaft." In English this is "Life-world and Science." Within the limits of an American's understanding, "Lebenswelt" means that everything immediately surrounding an individual is part of that life. "Lebenswelt" and "Wissenschaft" place boundaries on the theme, while being bounded themselves by the conjunction "und" or "and." This conjunction suggests a connection loose enough to allow both ideas to maintain some autonomy. The nouns live in a shared space but are on parallel tracks. Steak and potatoes—delicious together or separately. They might stay on the same plate, but they need not become one new thing. Steak as potatoes is altogether different.

Similarly, the word "and" between the two nouns, "Life-world and Science," allows them to maintain their categorical meanings and their separate set of functions within the relationship. Categorical meanings that maintain individual identity change when the conjunction gives way to the preposition als (as), producing the title "Geschichte *als* Argument" (History *as* Argument) and turning the noun into a modifier. In other words, the preposition attaches to its prepositional complement "Argument" to modify "Geschichte." "Argument" no longer shares the stage as an equal. Consider the potential for conflict that this preposition invites. Conflict by another name is stasis, the place where we are stuck (Cicero,

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1949; Fahnestock & Secor, 1988). Fahnestock and Secor examine these stuck places using the following nested dimensions: does it exist, (if so) how do we define it, what value does it hold, what caused it, and what action should we take now?

"Geschichte" attached to "Argument" makes the definition of Geschichte stickier. The small preposition calls definitional norms into question. The effect is only possible because words are slippery. Words are slippery because of all the meaning each word contains (Becker, 1991). "Geschichte" is not definitionally locked into the canonical facts or it could not be modified by "Argument." That Geschichte could have multiple meanings arises because our brains can only hold so much information. We must use one word in a lot of ways, even though that sloppy abundance makes it harder to communicate exactly what we want to say (Hopper & Closs Traugott, 2003).

That abundance is evident in the definition of history provided by The Oxford Dictionary. Geschichte/history is:

1. The study of past events, particularly in human affairs
2. The whole series of past events connected with someone or something
3. An historical play
4. A record kept by a web browser of the web pages and other files it has been used to access

History as a branch of study considers time past. While important moments can become so iconic that to the casual observer they seem without context, historians know that context informs the whys and hows, adding complexity to understanding. As the study of past events, history has a close relationship with time and yet transcends it; it is what is remembered, and yet it is what is forgotten in the fog of memory. It includes facts that are not in dispute. The war happened. The soldiers are in graves. The building in that picture no longer exists.

But modifiers narrow the abundance of meaning. Argument, before becoming the modifier of history, is a means of persuasion from credible speakers to their listeners when the facts are in dispute (Aristotle, 1991). Argument includes not only what is said, but also how it is said. That said, an argument can be conveyed completely through silence as when two people refuse to engage. Arguments emerge from small examples of inductive reasoning, as in "we cannot let this child starve." But it also emerges from deductive principles that cover larger territory, as in "children deserve

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our care." The study of argument includes its logical fallacies, such as if you can't prove I did something wrong, then I didn't.

In addition to definition, during this conference related discussions around value and cause lived under the surface. The conference took place around the same time that the historian Daniel Goldhagen published *Hitler's Willing Executioners* (1996). He was scheduled to appear but ultimately did not. During opening remarks, the speaker suggested that Goldhagen's book would be a topic of discussion even without his presence (Seewald, 1996). Goldhagen's text examined German complicity in Hitler's plans for the Final Solution. The author's website states that the book "told buried truths about the tens upon tens of thousands who carried out Hitler's plan to exterminate the Jews" (2013). Whatever the final analysis of Goldhagen's "buried truths" might be, his claim that truths were uncovered suggests a kind of archeologist's excavation. Dig deep enough and the truths will appear. From that perspective, Loesch might have considered crossing out the words "als Argument" to show a point of view closer to Goldhagen's "buried truths." A view of history in which argument plays a lesser role might have emerged as:

Geschichte ~~**als Argument**~~

**Geschichte** als Argument

That was not Loesch's approach because of other evidence that seemed more salient—evidence in which typeface would play a role.

### Analyze the Parts: Typeface

Drucker (1994) speculated that typography can in some cases "mark" its text, affecting how we experience it. Doyle and Bottomley (2009) went further with early proof that "[t]he meaning of the word is pulled towards the meaning of the typeface (assimilation), rather than pushed away from it (contrast)" (p. 396). Typography subtly marks a publication as an academic journal instead of a popular magazine. A typeface can exhibit an emotional aspect that can be measured (Koch, 2012). Koch found that a heavy typeface (e.g., Helvetica Bold and Helvetica Bold Extended) can elicit an increased sense of dissatisfaction and fear more than a light typeface.[3] Loesch used a heavy typeface.

Many have described typeface meaning as connotative (Doyle & Bottomley, 2009; Morrison, 1986; Van Leeuwen, 2005; Wendt, 1968). Van Leeuwen

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(2005) posits that connotative meaning in typography strengthens cultural expectations and communicates metaphorically (as when the word angry is ANGRY). Some have engaged in quantitative findings (Doyle & Bottomley, 2009; Morrison, 1986; Wendt, 1968). Doyle and Bottomley's three broad categories: Evaluation, Potency, and Activity, are also known as EPA. Bold typefaces are more Potent (strong, hard, rugged). Italics and Obliques are more Active.[4] Some typefaces are more positively Evaluated (pleasant, good) than others, making all of these complicated shapes much more than a container for words. Helvetica Condensed Black marks the words Geschichte (history) and Argument. Consider the outcome if Loesch had made a different choice.

Geschichte als Argument

Caslon, a classic face designed to be readable, reeks of history, which might have made it a suitable choice. First introduced in the eighteenth century, it was used to set the United States' Declaration of Independence during a time of political and cultural upheaval. But dissatisfaction and fear are not a quality Caslon embodies. It contains the pleasant qualities of Evaluation found in EPA. It is a measured and readable face, suggesting a revolution that had a clear head.

The lowercase and uppercase letters of Caslon are easily discernable. Compared to other typefaces, such as Helvetica, the height of the lower case (the x-height) is proportionally smaller than the height of the uppercase capital letters. The exaggerated variation between the x-height and the ascender (extending above the lowercase letters) makes reading easier because the undulations in the upper half of the letterforms provide clear shape differences (Tinkel, 1996). Further, each letter is distinct. The "a" is unlikely to be confused with an "o" or "e." As Ruari McLean (2000) points out in *The Thames and Hudson Manual of Typography*, "[t]o try to make something legible, the designer must know *what* is to be read, *why* it is to be read, *who* will read it, and *when* and *where* it will be read" (p. 42) making situation a key component of selection.

The size and weight of Helvetica Neue Condensed Black give it a feeling of being almost indestructible. Because of its larger x-height, reading might not be as easy, but ease of reading is not why this face is meant to be read. With its strong physical presence, it should still be around years from now as an artifact that survived until its buried truths could be unearthed. The physicality of Helvetica Neue Condensed Black amplifies what is strong,

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hard, and rugged. Further, the large Potent typeface implies that the sounds it also represents would be louder than a smaller version of the word. But strong presence and loud sound are qualities that become ironic in the face of the shredder. When Loesch shreds the type, he transforms the Potent message of a strong visual presence into something on the losing end of a rock/paper/scissors game. This evidence of loss plays a strong role in the meaning we take away from this design.

### Analyze the Parts: Image

The experience of loss was inspired by another moment in German history, the fall of the Berlin Wall in 1989. As Germany realized what was about to happen, Stasi the East German secret police, destroyed files (Gauck & Fry 1994; Skolos & Wedell, 2006). Loesch notes that there were millions of files that proved the government had been complicit in horrible acts. The GDR's Stasi (*Staatssicherheitsdienst*) continued to the last minute (U. Loesch, personal correspondence, February 15, 2021) until revolutionaries could occupy Stasi's regional centers (Gauck & Fry, 1994).

Loesch's visual information mimics Stasi's destructive shredding. The image of shredded paper amplifies destroyed truths and diminishes the potential for all buried truths to be uncovered. While shredded paper is the inventive opportunity, not all images of shredding could amplify the destructive aspect as effectively. Consider that on photodisc.com, a stock photography website, there are approximately one hundred photographs that appear when "shredded paper" is typed into the search box. The results from that site suggest default interpretations including: "protect my personal identity," "buy a shredder," or "make confetti for the World Cup." Stock photography needs typical situations. But just as the right words make all the difference, and just as typeface must be carefully chosen to join word meaning with shape meaning, an image that is only *adequate* will not contain the spatial relationships, colors, and textures that re-frame and re-present the intended meaning. A relationship that suggests confetti invites the audience to imagine inconsequential activities. In making a more successful choice, one with immediacy and impact, Loesch gets closer to the real. Loesch points out that in German, a shredder is a tearing wolf, a "Reißwolf," a meaning that English speakers likely don't know, but one that the image suggests as it tears away at the conference title.

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Like "I Am Not a Rug" from the introduction, this image suggests the use of the selective code (Gombrich, 1982). As noted earlier, the art historian Ernst Gombrich defined the selective code as careful "editing" to narrow the image down to those features that an audience will find most useful within the situation. Gombrich explained that for a student of anatomy, a picture of a bloody dissected frog has too much content to be useful. In all that gore, it is hard to separate the bones from the muscles, tendons, and ligaments. Those individual parts are more easily considered when an illustration selects only the useful features, leaving the blood to the imagination. The selective code *selects in* and *selects out* depending on the situation. The biology class selects out the blood through simplified shapes. PETA often selects in the gore using realistic representations. Loesch selects out the shredder, the people shredding, and documents from 1989 that inspired his work. He selects in only the immediate victim of the tearing wolf: the conference attendee who is part of the materiality (Gries, 2015) of the situation.

There is no actual shredder because that would put more emphasis on machines over outcomes. To show humans engaged with the shredding, would suggest a particular villain instead of an ongoing process at work in multiple situations. We can imagine many villains going forward. In shredding the actual cover, the evidence of what has been shredded maximizes its impact. The victim of the "Argument" is the person who paid to attend the conference and has been accepted to speak. While Loesch could have latched on to the metaphor of the wolf or added symbols linked to Stasi, he uses shapes tied to lived experience, producing the evidence he wishes to amplify. The truths destroyed mirror the three-dimensional world we inhabit. The wolf tears at the conference itself. Even so, this single example suggests a continuing problem.

## The Purpose behind the Altering Effects

Scott Consigny (1974/1995) notes that invention in argument does not reliably emerge from unbridled creativity because that approach will ignore important needs of the situation. Similarly, an approach that is too constricted ignores new creative possibilities that lead to better solutions. Creativity needs to develop options within boundaries. Consigny tells us that one way to strike this balance is to work within the commonplaces.

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To move past the definitional stuck point, Loesch uses *amplification and diminution* as his inventional arena. Geschichte/history as uncovered truths is diminished because there is nothing to uncover. Instead, the amplified shredding ensures that the definition of Geschichte/history includes the concept of loss. The destruction is more powerful because it annihilated a Potent typeface. While these destroyed spatial relationships could have many interpretations, they are narrowed by the phrase "Geschichte *als* Argument."

The Stasi incident showed that the word "Argument" could have a new sense, or altered meaning, because of the shredded paper, changing a default definition to a more sinister view, like the abusive spouse who tells the police it was only an "argument." As a sinister modifier, "Argument" amplifies history as facts destroyed—never to be found again. This destruction has a direct effect on the 41 Deutscher Historikertag München (41st Congress of German Historians, Munich), on 17. bis 20. September 1996 (September 17 to 20, 1996), when attendees would be at Ludwig-Maximilians Universität (Ludwig-Maximilians University). Typeface and image communicate needed information that is now gone. In the interaction of image, text, and typeface, shredded paper becomes visceral evidence that what is whole can be easily lost. The smaller typeface in red re-states but also diminishes the original size and potency of the large black typeface.

Consider what would happen if the direct and indirect experiences were flipped, How would Geschichte/history become an image that communicates its broad topic? A mural would have to embrace multiple cultures and events. All that information would produce visual confusion and a failed result. The word Argument needs to be slippery so that it can serve the noun. It would no longer have help from that elegant preposition. Describing the effect of shredded paper in language would require a longer text to direct our imaginations. In that process, we miss the experience of evidence. Text would fail to burn the critical thought into our retinas. Switching modalities removes what direct and indirect experiences do best.

### Inter-play Outcomes: Probative Inter-play as Complementary Meaning

When "Geschichte als Argument" goes through the shredder, the Potent face becomes impotent, providing evidence that history is as much about what is lost as what is saved. Ironically, the loss of meaning is the meaning

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this experience delivers. In showing that history defies easy definition, neither text, image, nor typeface act individually or as the primary site of meaning around which all the other ingredients hover. On one hand, this altered view of history narrows the multiple interpretations of shredded paper. But on the other, the definition of history and the sinister effect that "als argument" has on it cannot happen without the shredded paper to change the ordinary definitions of both argument and history. Shredded paper develops and modifies the effect on history, showing the shredding of a truth. The artifact redefines "Argument" as proof denied. In the interplay of image, text, and typeface, the design is an event that amplifies the loss of events. Each part plays a role using its area of relative certainty.

Complementary meaning emerges as probative Inter-play in the space between the shredded paper, the typeface, and the text. No matter how many truths Goldhagen uncovers, there are more that could have been destroyed. One can look at the evidence in the face of history and find the proposition more likely true than not. The amplified shredded paper diminishes the strong typeface, which affects the modifier "Argument," which owes a debt of gratitude to the seemingly insignificant word "als." All collaborate to create an altered definition.

The effect on an audience has three potential outcomes linked to assumptions, prior knowledge, and beliefs. The work could clarify, contradict, or challenge their existing points of view. If Loesch's argument reflects a sense of their own perspective but in a way that invites them to see it anew, he will have clarified their experience, giving them a better way of conceptualizing it. For someone who fundamentally believes that history uncovers hidden truths, this new definition will challenge their perspectives. Contradiction is also possible. One might argue that these moments of mass destruction suggest temporary madness in a world turned upside down. The temporary effect is a moment of contradiction. The brilliance of Loesch's work is that it can go in any of the three directions and still provide evidence of the claim.

## Pre-Task Experience

Compositions need to be interesting and organized or a potential audience will look elsewhere. The need taps into the paradox of choice (Schwartz, 2004). Too many choices concerning where to look is frustrating. In a

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design that employs chaos and destruction so meaningfully, creating organization is a bigger challenge. To achieve this balanced effect, Loesch limits color, creating a wash of whites and grays that pop only where the type meets the shredded paper and where the more diminutive red text sits on the shredding. The negative space shape, the background for the shredding, is the same color as the paper strips, which hold them to the page, amplifying the destruction and minimizing the clean sheet that lies beneath, so that where the destruction begins and ends is less apparent. In addition to color, the composition unifies through proximity in the overlapping strips of paper and their similar shape. The most interesting aspect of these unifying and contrasting features is that the strong alignment in the "original" cover, before it went through the shredder, is not repeated once meaning is destroyed. That decision has the effect of amplifying the chaos, which alignment would negate while keeping just enough control through other similarities that a viewer doesn't feel lost. The composition must show disorganization or the loss of meaning won't amplify. But it also must be unified, or the audience will be lost in visual conflict. That combination of organization in chaos invites continued looking and contemplation.

### Distorted, Simplified, and Non-Objective

Realistic images, such as the shredding, offer evidence as simulated actuality. The cover is actually destroyed, showing how easy it is to remove history. But other image categories have their own strengths. Distorted images offer evidence as tantalizing possibility. It is a world that has been altered in unnatural ways. Simplified images remove visual complexity. Non-objective shapes often act as symbols like letterforms. Here are four examples.

A trailer for *A.I. Artificial Intelligence* (Rotten Tomatoes Classic Trailers, 2018) first offers a hazy distorted view of a young boy as text appears and fades. It states, "David is 11 years old." "He weighs 60 pounds." "He is 4 feet, 6 inches tall." "He has brown hair." "His love is real." Up to this point the distortion does not challenge expectations of a real boy until the text "But he is not" appears. The text and most of the image fade as his realistic-looking thumb goes to the lens to make a thumbprint. At first, it seems to be an ordinary print, but it is a thumb-shaped computer chip, a surprise distortion.

The surprise clarifies "but he is not" as it challenges ideas about whose love is real. The sequence relies on typeface and text to create the full

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meaning. When the internal circuitry of a computer chip overrides our default imagination of a thumbprint, a world that did not exist now does.

If realistic images offer evidence as actuality, and distorted images present evidence as possibility, simplified shapes can soften reality. In a website called slaveryfootprint.org, the headline reads, "How Many Slaves Work for You?" But the actual chains that would prevent free movement have been turned into a simplified drawing using colors and shapes found in lower school construction paper. The image both presents and softens the serious nature of our desire for convenience as we unwittingly hold others in a kind of bondage. Had this been a realistic image of chains, the design might have lost the intended audience who would not have seen themselves as persecutors. By housing a serious question in light-hearted images, the design allows us to maintain our sense of ourselves as bright spirits who could never enslave anyone, only to learn that our practices are not as benign as we would like to believe. The irony of the situation solidifies in the experience.

Non-objective shapes can take many forms that do not have counterparts in the natural world. The Winter 2000 issue of *Critique Magazine* used Thoreau's famous quote, "Simplify, simplify." The designer used a hand-drawn line to strike out one of the "simplifieds." That non-objective shape does not need to be translated as it does its job.

Infographics offer many opportunities to synthesize non-objective shapes with other categories of shape to represent comparisons. In the design on the next page (figure 2.2), Peter Ørntoft blends realistic with non-objective shapes to show the percentage of people who have or have not changed behavior based on gang-related crimes in the area. Ørntoft not only overlays non-objective shapes on the humans who represent different reactions to crime, he uses movement to suggest how much they have been affected. Ørntoft notes that, "knowledge of a subject's context is key in understanding and conveying it" (n.d.).

Ørntoft elects to fully cover the body on the right that represents 55 percent of the community. He could have covered only 55 percent of that person, making it align with the numbers. But it is the comparison that matters here. The designer makes that easy to see while keeping the ratios true. One body represents 55 percent. What draws me to this graph is how it works both as information and as visual/verbal story. You can see the largest percentage venturing out contradicting the assumption that people

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18%
Have changed their behaviour a lot because of gang related crime
26%
Have changed their behaviour because of gang related crime
55%
Have not changed behaviour because of the gang related crime

**Figure 2.2**
Interest #6 (Designer: Peter Ørntoft). © 2011. Reprinted with permission.

were staying home because of gang violence. The person on the left shows the social isolation of that smaller group, suggesting a consequence as well as a comparison. That person's head is down, indicating that some miss out on social events. But for the person on the right going forward, we see that even the eyes are covered in a kind of "see no evil" blindness. The group this person represents has put itself at risk. This combination of visual/verbal information and story suggests the need to consider policy options in light of the actions connected to these numbers. Those who go out are more likely to be affected at some point by the crime they do not fear. A smaller number might feel isolated, but because they are a small number, governments might not need as much funding for mental health initiatives. It's a perspective that's quickly available for discussion. Ørntoft's work shows how non-objective shapes paired with realistic shapes use the principle of relative certainty to invite task-based looking (Yarbus, 1967) while echoing Arnheim's (1974) finding that humans are attracted to objects that look familiar. Because we are wired to notice faces (Parvizi et al., 2012), people connected to comparative shapes help us see why the numbers matter.

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## Summary

The principle of relative certainty informs the use of image, text, and typeface, revealing how important each modality is and how choices as small as a conjunction versus a preposition or a lightweight paper versus a heavier weight can be crucial. We can use the slippery nature of words to our advantage, inviting images to alter the meaning of words, while words simultaneously narrow the image's many possible interpretations. In Loesch's "Geschichte als Argument," realistic images portrayed the actual proof needed to get the point across. Part II looks at how these raw materials tie together through Grouping and Bridging Ties.

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# II Relationships: Binding Image, Text, and Typeface

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## Prelude: The Value in Noticing

There is no relationship until you notice it exists.

Two functionally independent ways of knowing must signal to an audience that they wish to collaborate to make the system work (figure II.P.1). This is no simple feat. How does it happen? What happens naturally in our minds needs Grouping and Bridging Ties on the page or screen. In Part II, chapter 3 describes how Grouping Ties[1] invite us to notice a relationship exists, allowing chapter 4 to explain how Bridging Ties[2] help us interpret that relationship. Unfortunately, the act of noticing is often dismissed as an obvious, lesser kind of knowing. That is a problem for three reasons. In some cases, meaning emerges in part through Grouping Ties alone. There are also types of Inter-play, such as the non-sequitur, where interconnected meaning doesn't emerge. In those cases, Grouping Ties exist but there is nothing to bridge. Even when there is, for bridging to happen, we must first notice the group.

When Grouping Ties alone bind structurally discrete text to structurally continuous images, they sometimes produce meaning without any help from Bridging Ties. Chapter 3 shows that Loesch's "Geschichte als Argument," the case study from chapter 2, includes areas where Grouping Ties work alone to communicate a loss of meaning as the intended meaning. The torn-up letterforms suggest but can no longer form words. The Bridging Ties have been destroyed. In situations like this, perception offers more meat than we give it credit for. Tacca (2011) argues that perception is not separate from cognition. He notes that the two "display the same structural properties and might have an analogous type of content" (p. 9).

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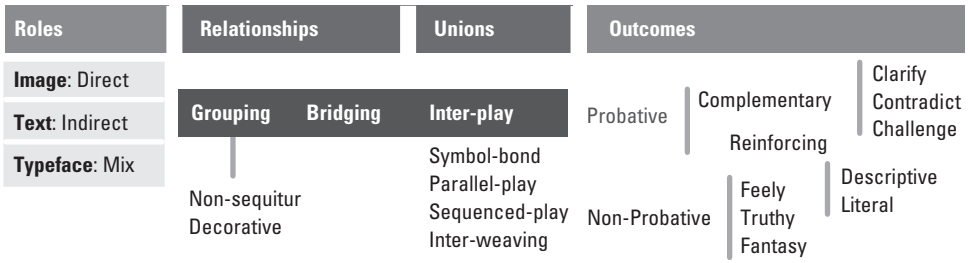


**Figure II.P.1**
Noticing and Interpreting Relationships: The Ties Within the Framework (S. Hagan). © 2022.

Further, without Grouping Ties, decorative and non-sequitur Inter-play become impossible to categorize. Looking for clear interpretive interconnections between text and image in those examples results in failure. But failing to synthesize an interpretation between image and text is not a disqualifying feature. Both types have a home in the framework.

More commonly, Grouping Ties are an initial suggestion to notice. Noticing provides a critical invitation into the connection so that we can process the bridge. A grouping that leads to a bridge between image and text does not guarantee a probative or non-probative result. So much depends on the content available to notice—the right raw ingredients. But the right ingredients would be useless if the audience did not first notice through the catalyst of Grouping Ties.

There are eight Grouping Ties and ten Bridging Ties that can build an array of loose to tight configurations. The next two chapters explain each tie, isolating them from the others so that the qualities of each are apparent. Then Part III illustrates how particular sets of Grouping and Bridging Ties create loose to tight unions of Inter-play capable of producing the non-probative and probative types, including the subset, complementary meaning.

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# 3 Grouping Ties: Noticing Relationships Built on Difference

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**Figure 3.1**
Animadverto Ipsom (S. Hagan). © 2021.

Rodney Dangerfield, a mid-century modern comedian, used to open with, "I don't get no respect." If Grouping Ties walked into a bar and met Dangerfield, the comedian would have handed over that line. Noticing should get more respect. It makes a difference.

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Dangerfield made a career of getting no respect. As a standup, he provided an experience we can all relate to because that sense of not being valued resonates. For Dangerfield, the insight covered his mortgage and bought his cars. Designers also have the experience of getting no respect. What is invention and composition is dismissed with the label "craft." While it's true that insightful crafting is an important part of the process, the knowledge required to help an audience decide, "it's interesting; it's organized" is no small feat. As this chapter will show, what at first seems not worth our attention produces types of Inter-play we cannot categorize without it.

Even though meaning begins with noticing, its mechanics hardly seem worth considering next to the all-important endgame—interpretation. And so, the strategies that designers spend years refining are relegated to the dismissive "make it pretty." This is difficult to understand because unifying visual elements is a complex challenge whether in a painting or in a multimodal experience. Within this challenge, the bar rises in Inter-play because two very different ways of knowing must pull on your coat with enough force to let you see that they're collaborating. By collaborating across differences, groupings emerge between structures made from continuous form (images) and those made from discrete units (text). If we could not form groups across these differences, the thought-provoking rewards of Inter-play would fail to materialize. Some see this disparity. Engebretsen (2012) argues for broadening analysis to include the perception of dimensions, color, and placement for the effect these elements have on the audience,[1] a perspective I agree with (Hagan, 2007)[2] and refine for this book.

Multiple shapes, without text, hold together through unifiers (Arnheim, 1974). But an approach that explains the ways that image information holds together cannot account for how different modalities perform a similar action. Reviewing the properties of unifiers offers a springboard to the Grouping Ties. Seeing how similar elements unite reveals why they inspire but can't account for the ways that different elements tie together. When form collaborates with units, new ties emerge that do not occur with form alone.

### Unifiers (and Contrast): Binding Continuous Form

It is hard to appreciate what unifiers do without bringing contrast into the picture. Contrast helps one object stand out from the others, **just as bold**

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**text makes this sentence stand out**. Imagine ten Rockettes in a line. This is a unified grouping. If I place Stephen Colbert in the middle of that line of dancers, I produce a striking moment of difference. Colbert is a (happy) contrast object whose presence "pops" as he invites us to **LOOK AT ME FIRST**. Contrast emerges from differences in size, value, complicated shape, recognizable form, texture, and isolation (Arnheim, 1974). Contrast enlivens and helps to create hierarchy. But without unifiers, contrast would devolve into visual chaos. Imagine that same stage and add John Oliver and Graham Norton to a Rockette and Dresden Frankfurt Dance Company mix. Without unifiers to bind the different looks and actions, the invitation to stay in that space goes away. You could compare it to a paragraph with five different topic sentences. Where should I put my attention?

Unifiers encourage the chunking of visual groupings. They emerge through *proximity* (the Rockettes are close together), *similar shape* (they are approximately equal in height and size), *continuation* (they form a line), and *closure* (if the Rockettes started to come together in a circle, but did not quite close it, our eyes would virtually finish the ring).

As you can see in figure 3.2, the shapes in the format on the far left (figure 3.2a) are not the same, but they unify because those dissimilar shapes are close together, suggesting a cluster that begins and ends. There is no stand-out shape with features unique enough to distinguish it and hinder clustering. But in the example to the right of that (figure 3.2b), the triangles form a cluster separate from the squares. Their *similar shapes* benefit from a second shared characteristic: similar value that is only within the shapes that are triangular in form. Next in the series (figure 3.2c), an invisible line of continuation holds objects together on a baseline—the invisible line feels like the ground that all the objects sit on. That alignment helps the audience see the connections because it is easy to follow. Finally, at the far right (figure 3.2d), closure suggests that a triangle is behind the square. We complete the form even though part of it is "missing." Any shape that only partially reveals itself, but has enough information to be understood, creates an opportunity for the audience to finish that shape. Scott McCloud (1994) described how comics would not be possible unless they employed this feature. Closure helps us finish suggested actions between each cell in a comic. In the following example, the triangle is "covered" but contains enough information for an audience to complete it and unite the triangle with the square instead of separating the odd 5-sided thing from that 4-sided thing.

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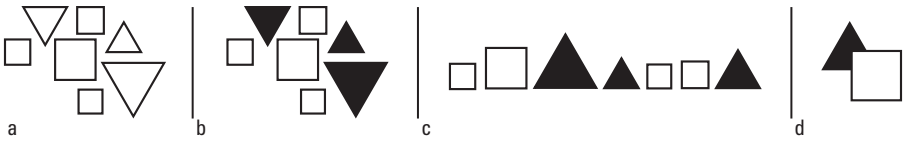


**Figure 3.2, a–d**
Proximity, Similarity, Continuation, Closure (S. Hagan). © 2021.

## From "Form with Form" to "Form That Ties to Units"

Unifiers join like-to-like in creating a whole composition, but to make sense of how Inter-play forms within a composition, we must understand how *like-ties-to-unlike*. As this chapter will show, the distinction matters for two reasons. First, tying like to unlike produces outcomes that unifiers cannot fully explain. Second, several Grouping Ties have no "distant cousin" unifier that inspires them. Those ties are completely unique and necessary, allowing us to account for all the ways that Grouping Ties offer a first step toward building new references and associations between two independent ways of knowing. Noticing them allows Bridging Ties to reveal new references and associations across the image/text divide. Folding noticing into Bridging Ties to create one tie category might seem to simplify the matter, but doing so misses three contributions that only Grouping Ties can offer. The first is decorative Inter-play where the visual provides mood rather than interconnected meaning. The second is non-sequitur Inter-play. The third occurs when Grouping Ties do all the meaning making work.

## Not That Slippery: Non-sequitur Inter-play and Grouping Ties

Non-sequitur Inter-play does not produce new shared associations even though we notice a relationship. Place the words *Dissecting a Frog* on top of an image of the Chrysler building. The relationship holds together because a layered-location Grouping Tie forms, but that grouping does not contain the potential for a satisfying new association that an audience can *share in common*. Unless there is a social niche, only the slimmest possibility for shared meaning exists.[3] Even though individual words have beautiful slippery qualities that invite images to alter their meaning, sometimes image and text slide too far away from each other to be able to collaborate. The iconic building has no frog-like qualities and cannot impact the meaning of the word "dissecting." That is not to say that individuals won't take away something from

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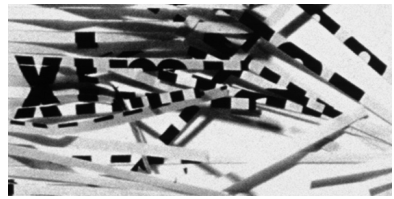

**Figure 3.3**
Geschichte als Argument (Poster, Designer: Uwe Loesch). © 1996. Reprinted with permission.

the pairing or that a book with that combination on the cover wouldn't explain it within the story, leading to new associations brought about by that longer explanation. Even so, on first seeing and reading, buildings and dissected frogs would not fit together. The relationship would end with the Grouping Tie. The framework accounts for those moments.

### Not in Evidence: Meaning from Its Absence

Consider this cutaway from *Geschichte als Argument* above. In this and other areas of that design (figure 2.1), Grouping Ties do all the work. There was a word, but it is no longer retrievable. We see an "x" and maybe an "i," but that is not sufficient to perform a semantic function. A Grouping Tie called shared-location between letter and typeface and a layered-location tie between the text and texture of the paper holds these structures together. The forms without function suggest that knowledge can be destroyed—a consequence communicated by the absence of a Bridging Tie. That contradiction made possible through Grouping Ties invites us to change the definition of history from what can be retrieved to what has been destroyed. It is a probative opportunity to consider that history belongs not only to the victors, but also to the forewarned. It invites us to explore the nature of meaning through its lack. Here, Grouping Ties open new inventive options and therefore earn not only their category, but also our respect.

### Grouping Ties: The Categories

Grouping Ties consist of three main groups with a total of seven individual ties shown in the chart (figure 3.4). Those three groups are: *location-groups, shape-groups*, and *trail-groups*. Location-groups require physical closeness.

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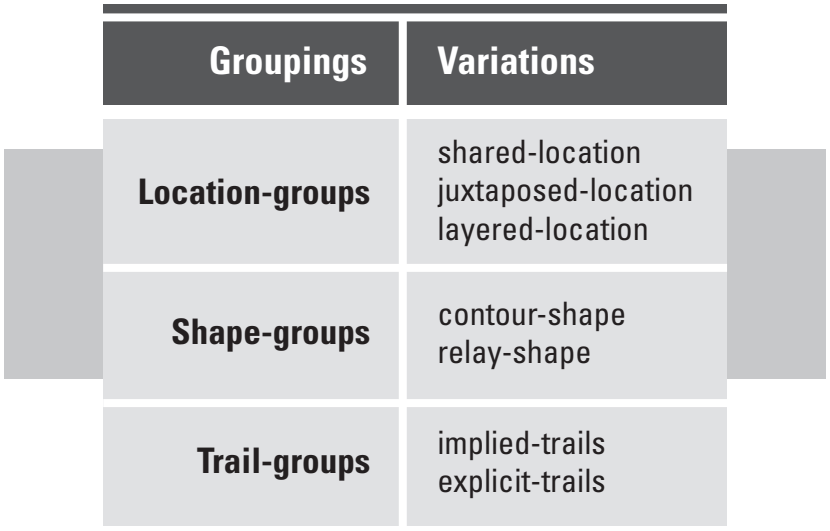


**Figure 3.4**
Noticing: The Grouping Ties (S. Hagan). © 2022.

Included under that umbrella are shared-location, in which text and typeface share the same space, juxtaposed-location, which binds text and image side-by-side, and layered-location, in which image overlaps text or text overlaps the image.

Shape-groups reflect an aspect of similarity between continuous form and discrete units. These include contour-shape and relay-shape.[4] Contour-shapes create a group when image and text have similar outside edges—silhouettes. In relay-shapes, the image forms only part of the relationship that text and its typeface complete, relaying one modality to the next. Finally, the trail-groups form because of an invitation to look outside of the text to the image and then back to the text again. A bolded **See figure "X"** is one simple example of a trail. Trail-groups include implied-trails and explicit-trails that can include an actual connecting line or shape that maps us from text to image and back again, making wayfinding easier.

As you read this chapter, it would not be surprising to feel that some of the ties have unifier "cousins." Juxtaposed-location feels like proximity. However, as noted earlier, many of the ties presented here have no "cousin" in the unifiers. Specifically, you will not find relay-shapes or trail-groups echoed in the unifiers. This is because unifiers work within similarities instead of

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across differences. Further, you won't find shared-location ties as any form of unifier because unifiers do not have to consider that different ways of knowing, aka text and typeface, must share space. We need a complete set of ties rather than a broken set of footnotes that "tie x" or "y" is somewhat like unifier "a" or "b." The next sections provide examples and more details.

### Location-Groups: Shared-Location Ties

Shared-location is the one Grouping Tie found in every example of Inter-play because text and typeface are a key defining characteristic. Typeset text connects the sound of words to the shape of letterforms, inviting us to notice that sight and sound live in the same space, bringing that relationship out for examination. For those readers who are more textually attuned, it might help to know that typeface lives within five basic classifications: serif (e.g., Times New Roman), sans serif (e.g., Helvetica), script (e.g., my guilty pleasure is Noelan), monospaced that suggests typewriter output, and display type with creative variations that tend not to prioritize readability and therefore are meant only for headlines. Serif typefaces evolved from oldstyle, with its broad sloping brackets/curves that meet the serif (e.g., Garamond) to transitional faces with their more refined stems and curves (e.g., Baskerville) to modern faces that eliminate the brackets in favor of a perpendicular joint between the stem and the serif (e.g., Bodoni). Slab serifs are a giant serif joyride (e.g., Clarendon). Sans serif faces, sometimes called grotesques, also fall into three categories: humanist (e.g., Gill Sans), transitional (e.g., Helvetica), and geometric (e.g., Futura). In no small part, these shapes developed because of technological constraints linked to ink, paper, and type materials. Wood and metal type became phototype and later digital. Digital type has had its own pixel-related challenges. While a student of typography might once have known the names of most faces (Vignelli, 2010) recommended five for the recreational user), digital capabilities have now led to over one-half million fonts (Extensis, 2019). In this abundance of riches, typeface selection has structural and functional consequences related to readability and meaning. As was described in chapter 2, Doyle and Bottomley (2009) empirically found that typefaces can influence the meaning of the text, something that Drucker (1994) suggested earlier. Given that typeface is not merely a container for words and that sound is associated with each letterform, shared-location between sight and sound can have important implications as *Cowgirl* (figure 3.5) shows.

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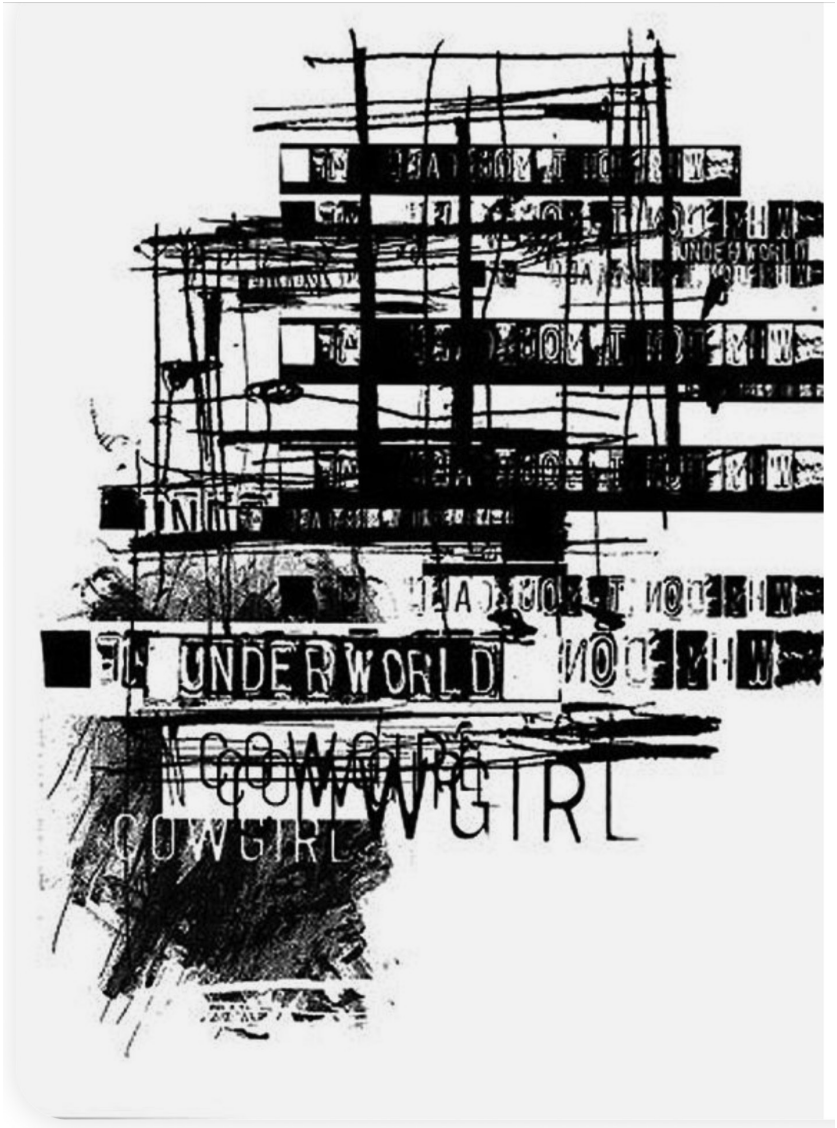


**Figure 3.5**
Promotional poster for a single by Underworld (Artwork by John Warwicker for Tomato; reproduced courtesy of Smith Hyde Productions). © 1994. Reprinted with permission.

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Shared-location identifies multiple dependencies between letterforms tied to nouns, verbs, and adjectives, but *Cowgirl* provides an opportunity to consider in more detail how typeface fused with other shapes influences our perception of sound and how sound influences the ways those shapes might develop. In this promotional poster for a song by Underworld, John Warwicker, the designer of the piece, uses Grouping Ties to prioritize sound over language (see figure 3.5). His is not a simple stylistic choice born from a radical graphics flavor. Like Loesch's work where the value of meaning emerges from its lack, Warwicker's use of shared-location groups creates form-as-meaning not through semantics and syntax, but by turning language into rhythm. In this visualization of Underworld's *Cowgirl*, shared-location manipulates language in ways that make it difficult to identify. Parts go missing. But for those who listen to the music, those distressed words exist as a visualization of musical intention. Like the song itself, this visual/verbal collaboration repeats words until we lose them in the beat. Each line of shapes in the poster shows letterform aspects. But the height of the horizontal lines and the black shapes between them begin to look like they are being birthed on a musical staff, not quite visible as they echo the experience of a singer who plays with the cadence of syllables that are not quite available as words. Letterforms are backwards, forwards, stamped over each other, in a typeface specifically designed for the poster. Through *Cowgirl*, Underworld offers a far more interesting exploration of rhythm than might have emerged if the words were easier to read. What becomes apparent is the value of the Grouping Tie that can divorce type from its expected linguistic function. With that realization, new function arises. Listening to *Cowgirl*, and looking at the poster, further integrates the sound and sight experience. From the perspective of Paivio's dual codes (2007), when Warwicker hides words and disguises letterforms, he transforms those elements from logogen to imagen's direct experience. The dominance of Grouping Ties seen in this work echoes the inventive core of the song. *Cowgirl* amplifies shared-location, building an experience that can only emerge by diminishing language. The Bridging Tie does eventually emerge because we can read *Cowgirl* and Underworld, but the Grouping Tie does so much more than make the Bridging Tie available. That these outcomes are possible is amazing because fonts are no more than sets of non-objective shapes. They do not occur in nature the way that a realistic scene or a distorted reflection does. And yet situations of use unite with our perception.

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Without the photons that typeface embodies, there is no direct experience connected with the text. Without the phonemes that typeface suggests within text, there is no indirect experience. The idea is simple but fundamental. Whether it is a font that came with our computers or one designed for a specific purpose, typeface offers sound, even in silent reading that changes with the changing face. There is only one word made from the letterforms s, p, e, a, and k, but there are many ways those forms can share location with the sound of speak or *speak* or ***SPEAK*** where each suggests a different experience.

### Location-Groups: Juxtaposed-Location Ties

*Juxtaposed-location* identifies relationships between images and text that are neither in an identical nor overlapping location. These ties form a looser connection that does not invite a particular sequence of looking and reading. One viewer might glance at the image and carefully read the text. Another viewer might skim the text and become fascinated by the image. As Redish (1993) points out, an audience decides how much attention to pay.

The juxtaposed-location tie between image and text (figure 3.6) illustrates a relationship between the box that holds the hand and the format that holds the body copy. Juxtaposed ties do not imply that any particular words join to any specific parts of the image. Text and image are structurally proximate, creating an easy saccadic jump from one to the other as the unlike forms associate. That images collaborate with textual shapes has become so common that it seems not to have consequences. But in fact, the two together can either reinforce knowledge or encourage lesser outcomes. When non-probative images exist alongside text, Zhang et al. (2021) have pointed out that those images, while not taken as evidence, will make accepting a claim easier. The consequences of a process that Bridging Ties usually complete, make even the simplest ties important to study.

### Location-Groups: Layered-Location Ties

Between the tightest Grouping Tie, the shared-location tie, and the loosest, juxtaposed-location, is the *layered-grouping tie*, which creates a tighter physical connection, but one in which image and text do not need to share all the same pixels. Layered ties sandwich a relationship between typographic

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and target different kinds of training. By combining all the common sources including concepts we traditionally categorize in a different way, writers can invent fully voiced life in ink and tree pulp.

**Looking for the Sources Behind a Voice that Can Be Heard**

In this book, you will learn how to create five basic sources that give life to voice. They are the "cultural sources," "insider sources," "outsider sources," "sources of place," and "storyboard sources" we discussed earlier. These sources will teach you how to create a world common to our shared experience even as your world stays unique to its single moment in time. By completing a series of exercises that focus on each of these layers, you will learn not only how to build each source, but also how to create a more complex set of combinations.

In each chapter, we will represent these sources with drawings that visually illustrate each concept. We do this for two reasons. First, while textual voice creates an image of the world using words alone, it is still an *image* of the world. Second, the use of visual cues in textual fields has been shown to improve learning (Levin, 1987, Mayer, 2002). The learning that visual images provide is "cognitively cost-efficient" (Gross, 2003). You'll learn it better and remember it longer.

In Part I we develop the sources that let a single individual emerge from the page. Chapter 1, "Cultural Sources: Memory drawings we need at first sight" explains why we need to keep stock images in our mind's eye for use in the real world. We call up these "stereotypes" every time we find ourselves in a new situation. These images contain the residue of earlier events that help us to believe we can immediately understand a new person on the scene. If we didn't use them, the world would soon become far too complicated, which is why writers fail when they don't provide these stock images for the reader.

When we as writers need to call up default memories of an insecure adolescent or the nagging wife, we must provide a view of the world that misses a lot of detail and nuance. But in doing that, we provide an immediate understanding. As you'll see, memory sources provide critical knowledge not only for us as individuals in the world, but also for the readers who want to hitch a ride with us into a world on the page.

REVEALING THE SOURCES OF VOICE 15

**Figure 3.6**
Voice I (S. Hagan). © 2021.

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women cannot
women cannot drive
women cannot be bishops
women cannot be trusted
women cannot speak in church
women cannot accept the way things are
women shouldn't
women shouldn't have rights
women shouldn't vote
women shouldn't work
women shouldn't live
women shouldn't suffer from discrimination anymore
women should
women should stay at home
women should be slaves
women should be in the kitchen
women should not speak in church
women should have the right to make their own decisions
women need to
women need to be put in their place
women need to know their place
women need to be controlled
women need to be disciplined
women need to be seen as equal
@UN WOMEN

**Figure 3.7**
UN Women (Christopher Hunt, Art Director for Memac Ogilvy & Mather Dubai). © 2013. Reprinted with permission.

shapes and the realistic, distorted, or abstract images presented by photography, drawing, or video. Consider UN Women (figure 3.7), where words overlap each woman's mouth. It is another case of a Grouping Tie offering an unexpected avenue into meaning through the inability to speak. Here, the Grouping Tie is not sufficient, but it is necessary because it presents the problem. Women from different countries and cultures have been silenced in different ways. The white bands are the claims of having been silenced. The text offers the reasons, which must be bridged to determine if the argument is likely true.

That layered-location tie creates a close connection between text and the part of the image it covers, the missing mouth. This figure/ground relationship encourages pinpoint foveal vision to focus on the overlap of missing speech. At the same time, saccadic jumps, the darting way the eye sees quickly in focus, and perceptual span, the out-of-focus area, capture faces from vastly different cultures, suggesting a global problem. Like the last example, the order of looking and reading does not change the relative certainty of the spatial relationships that inform image meaning, allowing some to prefer text, while others prefer images (De Palo, Sinatra, Tanucci, Monacis, Di Bitonto, Roselli, & Rossano, 2012). Whether the order of looking begins with the eyes and then goes to the text to see the specific way a woman has been silenced, or the other way around, re-presentation of the image's spatial relationships guarantees that the sense of the whole will remain stable. Any sequence of looking will reveal the same structures

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and intentions within them. Location-groups, whether shared-location, juxtaposed-location, or layered-location, rely on a continuum of physical closeness. The next category, shape-groups, relies on resemblance across two modalities.

### Shape-Groups: Contour-Shape Ties

In contour-shapes, the outside edge of a block of text will have a similar size and shape to the outside edge of a photo or drawing, helping to unite the silhouettes of continuous form with discrete units. Contour-shapes are common in grid design because a grid's columns and rows encourage expressions of resemblance, where image, text, and typeface occupy modules. Grids offer elegant organization by limiting unintended complicated shapes in the negative space area. Müller-Brockmann's (1981) work provides classic exemplars of contour-shape ties, where both image and text edges perfectly align within modules and spatial zones, bounded by rows, columns, and gutters.

In Zeng's work (figure 3.8) a modular grid with four columns and repeating rows uses spatial zones (multiple modules) that image and text/typeface structures occupy. In these modules, the contour-shape ties are clearest in the "Hover over me" section, where the text fills one module next to an image in a different spatial zone. That tie is also in the "Designing for Joy" spatial zone with its large, reversed-out edge that shares a contour with the image examples. The "Designing for Joy" spatial zone uses a green reverse to give a sense that the zone is complete. "Hover over me" lives in an implied container completed through closure.

Contour-shapes do not suggest an expectation or invitation to look or read in any order. While the outside contour supplies similarity between image and text, inside the modules, similarity ends as letterforms fill one module, and image elements fill another, reinforcing the relationship of differences. As usual, shared-location between text and typeface contributes.

### Shape-Groups: Relay-Shape Ties

Like a team where no one runner can win the race alone, a *relay-shape* is one where meaning cannot form unless both typeface and image complete the race together. In other words, part of the text and typeface relays with

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**Figure 3.8**
Designing for Joy (Designer: Jimmy Zeng). © 2020. Reprinted with permission.

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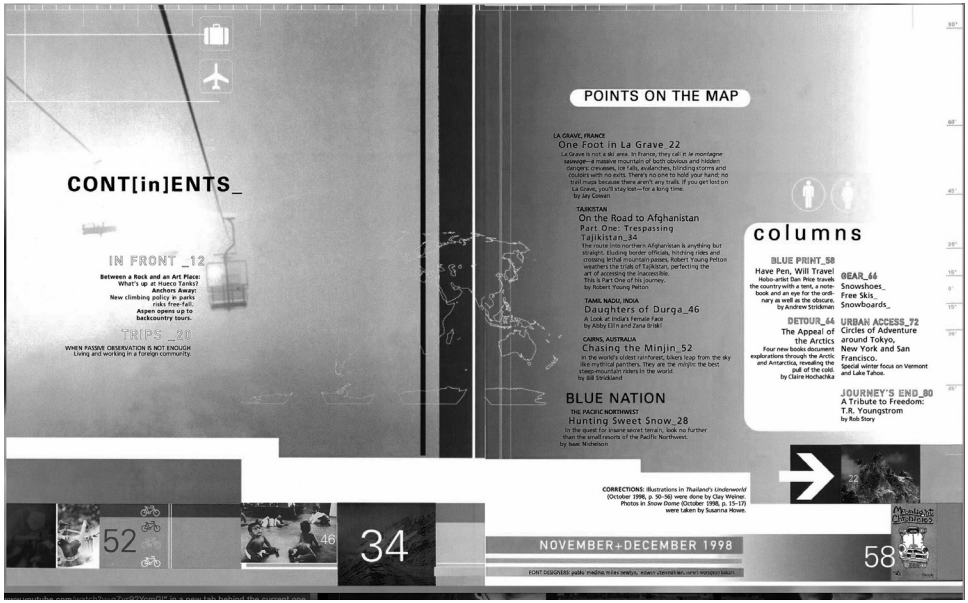


**Figure 3.9**
Table of Contents: Blue Magazine (Design Consultant: David Carson; Art Director: Christa Skinner). © 1998. Reprinted with permission.

part of the image, completing the hybrid shape. This is the case in an issue of *Blue* (figure 3.9), a magazine founded by Amy Schrier with David Carson as design consultant, and Christa Skinner as art director. Here the table of contents page reinforces the mission of a magazine devoted to expressing a more adventurous perspective on travel. The curved edge of the text, which begins to form a circle, creates part of the relay by suggesting a round shape. The relay completes because of the outlines of countries close by. The negative space shape created by the curved edge of the text suggests a home for the placement of the countries, while the outlined countries allow the curved edge of the words to make sense. These unlike elements can only collaborate because they cooperate. But neither loses its unique purpose.

If the text edge was not there, the landmass would have no grounding. And without the landmass, the text has no reason to form that curve. Notice that the landmass is close enough to the edge of the text that the relationship is easy to spot. Move the land shapes to the other side of the spread and this tie might become so tentative as to be lost. There is

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more compositional complexity to a relay-shape tie than to a juxtaposed-location tie because the structural relationship between two unlike forms is more tentative, relying on the audience to do more work to notice those relationships as discrete units tie to continuous form.

Relay-shape ties create relationships that don't suggest a particular sequence of looking and reading, but *trail-grouping ties* encourage that sequence.

### Trail-Groups: Implied-Trail Ties

The final category of Grouping Ties is *trail-grouping*. As with all the Grouping Ties, it connects imagens and logogens that will trigger new references and associations across systems. The systems must engage with each other. One type of trail-grouping tie is the *implied-trail*. Implied-trails are invisible areas of alignment that flow between image and text. These trails do not occur when one paragraph aligns with the next because that is a simple case of like-to-like, and as such, is a unifier. But when an image connects to text using an implied-trail, as seen in the page spread (figure 3.10), a primarily visual structure—the rubbing—links to a primarily verbal structure, the typeset type that is to its left, completing the reading experience as the modalities morph. The rubbing is not a placement of text. It is an image action.

This implied-trail aligns the last part of the sentence, "writers move under the surface to . . ." and then there is a hazy emergence of a rubbing. Rubbings as drawings are part of the imagen system. In that visual expression, an implied-trail forms, creating a stronger grouping, transiting the audience from one way of knowing to another.

### Trail-Groups: Explicit-Trail Ties

As *Multiple Layers Improve Success* (figure 3.11) suggests, explicit-trails mark out a traceable visual path from the text to a referenced image, which suggests a stronger relationship at that specific point, one that makes it easier to move from looking to reading. In *Multiple Layers*, a thin line moves from text to the relevant part of the image that the text references. Notice that the trail from "Masks" directs us to the early lines of defense while the "Vaccines'" pointer links to the final Swiss cheese layer. The space informs a mental model that begins with the easiest thing to do and ends with the

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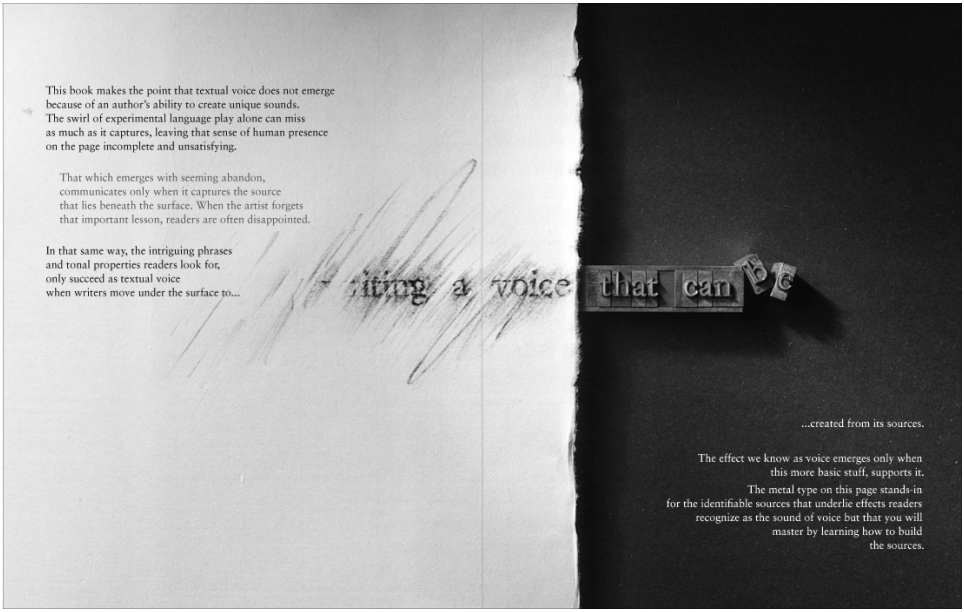
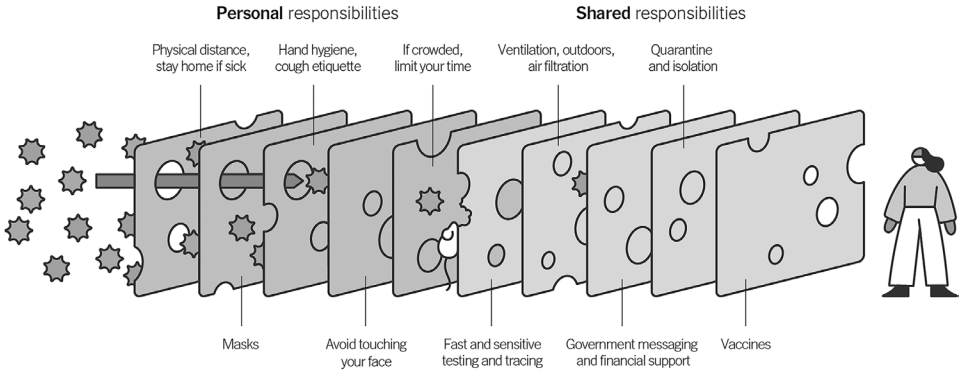

This book makes the point that textual voice does not emerge because of an author's ability to create unique sounds. The swirl of experimental language play alone can miss as much as it captures, leaving that sense of human presence on the page incomplete and unsatisfying.
That which emerges with seeming abandon, communicates only when it captures the source that lies beneath the surface. When the artist forgets that important lesson, readers are often disappointed.
In that same way, the intriguing phrases and tonal properties readers look for, only succeed as textual voice when writers move under the surface to...
iting a voice that can
...created from its sources.
The effect we know as voice emerges only when this more basic stuff, supports it.
The metal type on this page stands-in for the identifiable sources that underlie effects readers recognize as the sound of voice but that you will master by learning how to build the sources.

**Figure 3.10**
Voice II (S. Hagan). © 2003.




Source: Adapted from Ian M. Mackay (virologydownunder.com) and James T. Reason. Illustration by Rose Wong

**Figure 3.11**
Multiple Layers Improve Success (Artist: Rose Wong). © 2020. Reprinted with permission.

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hardest to accomplish. Explicit-trails like these show a structural relationship between image and an element of text within a larger composition. Explicit trails can prevent confusion. If this example used layered-location ties instead, the text would be unreadable, and the image would be less easily understood.

When explicit-trails appear in longer passages of text, they can replace parentheticals such as "(See figure 10)," which does not offer a strong invitation to move from sequential to spatial processing because a parenthetical is not a strong command. Asking an audience to move from their practice of discerning intent in the text to the expectation to search for image information flies in the face of the "rule of simplicity" (Arnheim, 1974; Goldstein, 2001, 2002). We like to do the simplest thing. Moving from the structure of sequential processing to idiosyncratic looking is not just a different sequence; it's a different system. That move is especially taxing when there is no easy way to get back to what you were reading when figure 10 cunningly invited you to look away. An explicit-trail makes the journey easier.

Explicit-trails usually pair with other Grouping Ties that act more globally. Shared-location and juxtaposed-location hold the larger-grained elements together, while explicit-trails can reinforce the smaller relationships. Unfortunately, books where looking is more critical, like biology and art history and the one you're reading now, still maintain a "(See Figure 10)" wayfinding system.

Explicit-trails also form when bolded words invite the move from text to an image as would be the case if a command boldly stated **look at the "cheese" now**. Then the cheese becomes easier to consider, knowing the bolded text is there to help you back. The bolded words marked a point between reading and looking that is easier to navigate. It suggests that when the audience finishes looking, a structure is in place so that they can find the way back again.

### Summary

Grouping Ties can seem obvious. But they are a necessary analytical step because they have functions that help to classify some types of Inter-play (non-sequitur and decorative) and in some cases, offer meaning potential all on their own. They also make it possible to identify the Bridging Ties. We need to fully understand the workings and consequences of the artifacts we

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put into the world. To paraphrase James Agee, as researchers, critics, designers, and writers, we *need to be aware of the enormity of what we are doing*. A square or rectangular image joining to a textual shape might seem not to have consequences. But those simple juxtapositions can clarify knowledge or encourage conspiracy theories.

Grouping Ties lead to Bridging Ties in the next chapter. Without both, complementary meaning is not possible. Grouping Ties explain how unlike structures work together through three subcategories. These are location-groups, shape-groups, and trail-groups. Location-groups include shared-location, juxtaposed-location, and layered-location ties. Shared-location ties are always part of Inter-play because typeface and text are part of what defines it. Juxtaposed-location ties, which show the side-by-side physical presence of image and text, create strong workhorse relationships without encouraging specific interactions across the unlike structures. Layered-location ties build figure/ground relationships in which the image is ground for the text on top of it, or the text is ground for the image. Layered-location ties allow images and text to share some of the same space.

Shape-groupings include contour-shape ties and relay-shape ties. Contour-shape ties strengthen relationships when the outside contour of the image echoes the outside contour of a text. Relay-shape ties strengthen image/text relationships when aspects of the image and the text complete each other.

Finally, the trail-groups create image-to-text relationships in one of two ways: implied-trails and explicit-trails. Implied-trails suggest invisible links between image and text. Explicit-trails develop relationships you can see between a sentence and an image outside of it. Explicit-trails can be actual lines from the text to image or bolded text, creating a structural link between sequential and spatial information within a larger experience.

Grouping Ties are one of the working parts of Inter-play that can help to address bias, but they just as easily can help create associations that reinforce bias. It all depends on the content tied. Knowledge of the ties enlarges opportunities to consider how loose to tight interactions can lead to either kind of outcome. Naming the parts of a framework that have the potential for good while not losing sight of their less desirable outcomes means that one part of Friedman's (2000) knowledge creation cycle gains the opportunity to be investigator as well as muse.

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# 4 Bridging Ties: Interpreting Connections between Independent Systems

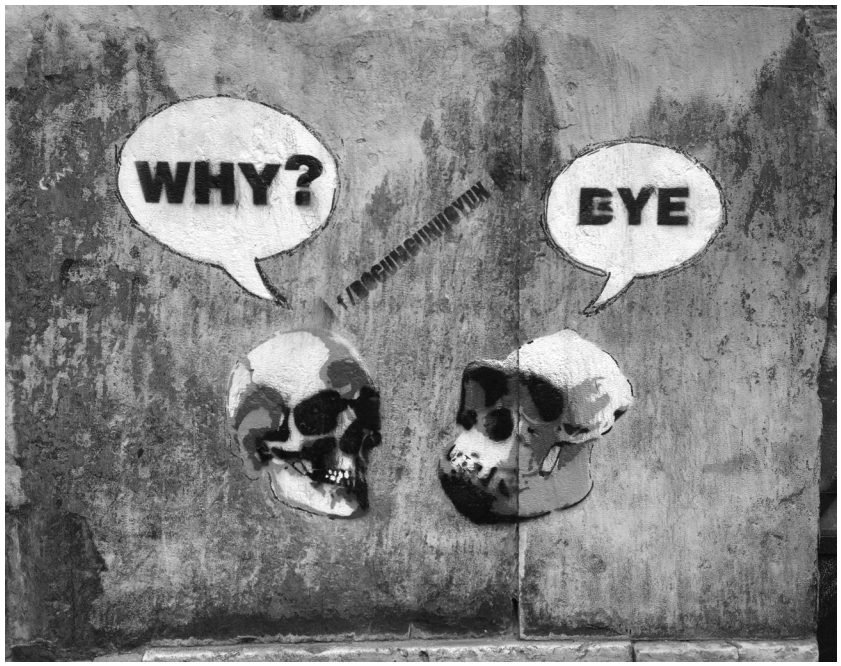


**Figure 4.1**
Why bye? (Photographer: S. Hagan). © 2012.

"Why" and "Bye" don't mean much until the Grouping Ties encourage spatial noticing that Bridging Ties complete. And then ". . . oh, I get it."

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In the "conversation" between these two (figure 4.1), image and text have meaning potential that Bridging Ties synthesize. The speech balloons are *referencing-images* connecting speech to each speaker. The rugged typeface shape *blends* with text. Punctuation differentiates statement from question. The skulls speaking are *Homo sapiens* and *Homo erectus*, identified through an *external bridge* to prior knowledge. The single words "why?" and "bye" with their *referencing ties* to those speakers suggest a deeper internal conversation linked to their individual situations. The result offers humor but also challenge. *Erectus* is gone. *Sapiens* despite all their questions might go too.

Separating noticing from interpreting provides accurate boundaries concerning the two actions needed to understand information delivered as Inter-play. When image, text, and typeface interact through Grouping and Bridging Ties, fresh references and associations between them are the product. When that actuality has probative potential, the ties either reinforce common associations, or in complementary meaning, clarify, contradict, or challenge assumptions or existing associations. When relationships result in non-probative Inter-play, Bridging Ties produce feely, truthy, or fantasy types (see the introduction). If image and text do not have the potential to create references and associations, when only Grouping Ties are present, non sequiturs or decorative Inter-play results. Bridging Ties complete the opportunity to communicate new references and associations across independent systems.

## Bridging Ties: Inspired by, but Not the Same as Cohesion

Both Grouping and Bridging Ties are part of a designer's intuitive practice. By uncovering the range of options that designers have already explored, what *has been* possible reveals what *could be* possible. This future thinking begins, as most ideas and practices do, in the Wayback machine.[1] The elements of cohesion in Halliday and Hasan's *Cohesion in English* (1976) inspire Bridging Ties but are not interchangeable with them. The seminal work those authors produced revealed that relationships develop *across sentences independent of syntax*, which inspired me (Hagan, 2007) and others (Acartürk, Taboada, & Habel, 2013; Engebretsen, 2012; Liu & O'Halloran, 2009; Thomas, 2009) interested in image/text relationships. Why isn't cohesion sufficient to explain how Inter-play forms?

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Recall that unifiers, which bind similarities between shapes, are not sufficient to explain how two different structures bind. Grouping Ties add needed relationships not found in unifiers and make it clear that these are ties across difference rather than relationships within similarities. The bonds that form between two different systems cannot be explained by the bonds within a single system. Conflating one with the other leads to black boxes that cannot be opened because the foundation cannot support them.

Cohesion in text reveals relationships between sentences that are uniformly sequential. But image and text, two functionally independent systems, need ties between sequential units and continuous form. The foundation must support the data. To arrive at rigorous analysis, it is important to know when we are binding similarities versus bridging across differences. Without those clear categories, we again end up with black boxes we cannot open when cohesion fails to explain the new data.

Complementary difference is an important assumption. The references and associations between image, text, and typeface do not simply occur outside of formal patterns, they occur in spite of functionally different systems. Reviewing the properties of cohesion offers a springboard to the Bridging Ties. Seeing how *similar elements form bonds outside of formal patterns* reveals why they inspire but can't account for the ways that *different elements tie* together. When text collaborates with images, what are the new ways they tie that do not occur with text alone?

## Cohesion: Binding Sentence to Sentence Relationships

How is it that a text, which relies so heavily on rules and patterns, can form meaning relationships across sentences, where rules do not exist to guide the reader across the gap? Halliday and Hasan's first case begins with, "[t]hree blind mice." From there we "[s]ee how they run." Even with the gap between the mice and the running, a child will know that the word "they" refers to the physically challenged mice we met in the earlier phrase. By teasing out the categories of cohesion, Halliday and Hasan identified the many ways that this quality aids understanding and just as importantly prevents confusion. Here are two sentences that do not seem to be related that show just how much cohesion matters.

Look at that sky. Alicia has a car that's orange.

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The two sentences come across as incoherent. However, change a single word, and the gap closes.

Look at that *orange* sky. Alicia has a car that's orange.

By repeating the word "orange," the two sentences make sense together. If there was only a single sentence, as Halliday and Hasan point out, syntax would solve the problem as in "this orange sky reminds me of the color of Alicia's car." But not every problem can be solved through syntax. The sentences in a paragraph cannot rely on it. They must be cohesive, or the reader might not see the coherence. Repetition from orange skies to orange cars is one way to create it. Reference is a second:

Martha, Kathy, and Kathryn are in Baker Hall.
If you run, you can catch them!

The second sentence contains the word "them," which *refers up and back* (anaphorically) to the particular "Martha, Kathy, and Kathryn" we met in the previous sentence.

Backward references like the last one, in which a pronoun in the second sentence refers to the noun in the first, are common. But references can also project *forward and down* (cataphorically, Halliday & Hasan, 1976) to the next sentence, as in:

These are perfect!
Oven-roasted tomatoes always turn out for Janet in this oven.

The "these" in the first sentence refers forward and down (cataphorically) to the fortunate tomatoes in the next sentence. The demonstrative pronoun precedes the noun it refers to. These options give writers the opportunity to make subtle changes that keep the text from being monotonous.

In addition to *references* and *repetition*, there is substitution. Substitution uses a synonym, which takes advantage of the slippery nature of words. Consider that slippery quality between a simple reference and substitution:

Kira is still writing her book.
She has been working on *it* for months, so I rarely see her anymore.
She told me the other day that *the monster* has taken over her life.

"The monster," a substitution that no thesaurus would provide,[2] takes the place of the book in the first sentence. If we had to be too literal to make cohesion stick, metaphors would be more difficult to play with. Language's slippery nature might be its biggest gift to communication design.

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In addition to references forward (cataphoric) and backward (anaphoric), and repetition and substitution, collocation forms through proximity, when two words have *the potential to interact* meaningfully.

> It's another football Sunday.
> The Clineses are ready to see how the black and gold will do.

Because of "black and gold's" proximity to the word "football," the words "black and gold" are no longer colors, but instead, a team (my hometown team, the Steelers). This is not substitution because "football Sunday" references an event, not a team. It is collocation that invites the words "black and gold" to change from colors to a group of people represented by those colors. Again, the variety of cohesive tools adds to the reader's experience.

Finally, loosely implied connections that begin outside of the text offer exophoric relationships.

> Mary experienced a "learning *comedy*" with her first baby. The child didn't hate the peas, she loved the ducks.

The *loose relationship* between "learning curve" and the context of new experience, turns curve into comedy, as Mary tries to understand that when her baby yells "guck," what they are really trying to tell her is that the wildlife in the pond nearby is fascinating—not that the smashed peas are inedible—even though they are. This exophoric relationship is a loosely implied link that starts with a connection outside of the text.

### From Cohesion within Systems to Bridging across Systems

Cohesion joins like-to-like, where every thought is a unit in a linear sequence. But Inter-play forms between functionally independent systems with the potential for interconnections that bind sequence and space, which none of the textual examples had to consider. Cohesion doesn't have to account for overlaps or shared spaces. Bridging Ties account for these different kinds of joining. Tying like to unlike has outcomes that are not the same as what cohesion produces. Cohesion doesn't need to account for a shift from reading about intent to searching for shapes within shapes. There are several Bridging Ties that have no "cousin" in cohesion to inspire them. Bridging Ties are both unique and necessary, allowing us to account for all the ways they help us interpret new references and associations between two independent ways of knowing. The examples that follow all

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have Grouping Ties, but only the Bridging Ties are considered in this chapter. The next chapter on Inter-play will illustrate the specific combinations of Grouping and Bridging Ties that create its loose to tight types.

### The Bridging Ties

There are five major types of bridges that contain ten varieties. As figure 4.2 shows, those divisions are *mergers, implied-bridges, referencing-bridges, proxy-bridges*, and *pairing-bridges*. *Mergers* have the tightest interpretive interaction between image and text as they join typeface's spatial impact on text to text's semantic impact on typeface. The second category, *implied-bridges*, forms in two ways. They either link from what we see on the screen to our external knowledge, or they bridge loose connections between image and text on that page or screen. *Referencing-bridges* provide textual references

| Bridgings | Variations |
|---|---|
| **Mergers** | merger-blends<br>merger-masks |
| **Implied-bridge** | external-implied<br>internal-implied |
| **Referencing-bridge** | referencing-text<br>referencing-image |
| **Proxy-bridge** | substitution-proxy<br>repetition-proxy |
| **Pairing-bridge** | coupling-pair<br>intersecting-pair |

**Figure 4.2**
Bridging Ties (S. Hagan). © 2021.

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to an image as the command "See figure A" might do, or they connect image references to text as a map legend might do. *Proxy-bridges* emerge when an image substitutes for a word, repeats a word, or vice versa. As a simple example, "figure A" without the command to "see" is a proxy for the image. Finally, *pairing-bridges* interconnect image and language where each contains only part of the thought. An image could show a beautiful pasture that invites imagination of one sort, while the text might say "toxic dump" inviting us to be skeptical of the scene. Together, new references form that suggest seeing is not sufficient and neither is reading.

As you read this chapter, it would not be surprising to feel that some of the ties are familiar. External bridges feel like exophoric cohesion. However, as noted earlier, many of the ties presented here have no "cousin" in cohesion. You will not find mergers in cohesion because it does not have to account for the impact that typeface shape has on text. Referencing-images also resist cohesion labels. In cohesion, a reference will go forward (cataphorically) or backward (anaphorically), but not both forward and backward as referencing-images will do. We need a complete set of ties rather than a broken set of footnotes that "tie x" or "y" is somewhat like cohesive element "a" or "b." Conflating cohesion with Bridging Ties frustrates more than it illuminates. The next sections provide examples and more details.

### Merger-Bridges: Merger-Blends

Merger-bridges bind a text/typeface relationship as blends and masks that bridge re-presentation through the image with re-articulation through the text. Merger-blends include only the text/typeface relationship, while merger-masks add image elements within the typographic shapes.

In this simple merger-blend (figure 4.3), the physicality of the typeface affects the expression.[3] Going back to Doyle and Bottomley (2009), this is a Potent relationship. As a reminder, they identified three empirically tested typeface dimensions: "Evaluation (good, pleasant, happy vs. bad, unpleasant, sad), Potency (strong, hard, rugged vs. weak, soft, tender) and Activity (active, fast, young vs. passive, still, old)" (p. 397). Typefaces that had positive Potency were bold versions. The authors note: "[w]hen products were presented in bold they were judged to be slightly more Potent than when they were presented in roman" (p. 406).[4] Typeface selection altered audience experience. While the Arial Black typeface shown next was not one of the faces in the study, its bold structure suggests a similar

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**Figure 4.3**
Arghh (S. Hagan). © 2021.

characteristic. That face would not fit into Activity because that quality tends to increase with italic/oblique faces, or Evaluation, which is found in serif faces.

Unlike the Grouping Tie shared-location, through which we notice existence, the blend isolates interpretation often informed by experience. For example, the typeface Corbel has open "c's" and less formal "g's." That informality could undermine a sense of rigorous effort and scrutiny. The spatial relationships that give words visual structure also color text with their history, their human or machine-like qualities, or their associations with a particular press or journal. Typeface/text relationships can also present a jarring dissonance when the function of the face is at odds with the intention of the text. Try setting the sentence "your test results have come back" in a flowing Zapfino script. Or consider how the word HATE can emerge from the words The Fate of the Earth when just those four letters are in a different typeface. In the next section, a second type of merger bridge, the merger-mask, requires images to live within the typeface.

### Merger-Bridge: Merger-Masks

To have a mask bridge, the image must map onto the interior of the typeface, providing opportunities for realistic images to live within the non-objective shapes of the typeface so that both can impact the meaning of the text. For example, the word "wave" could be a friendly gesture, a dangerous riptide, or a surfer's dream. By creating a merger-mask, any of the three options might live within that word, joining re-presentation to re-articulation and narrowing the many interpretations of the word. The word by itself contains some uncertainty until the choice of image completes the functional tie.

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### Implied-Bridges: The External-Implied

External bridges emerge when a designer or artist encourages us to tap into prior knowledge to inform a new experience.[5] Prior knowledge always influences interpretation, but in these cases, the design has an agenda. In figure 4.1, the skulls represented two different points of view. Only prior knowledge could inform the evolutionary significance they represent.

### Implied-Bridges: The Internal-Implied

Internal bridges within the screen or page emerge when connections between images and text are loosely implied as part of a big-picture relationship. Internal bridges invite the audience to look or read at their own time and pace. In figure 4.4, the image shows the brain, while the text

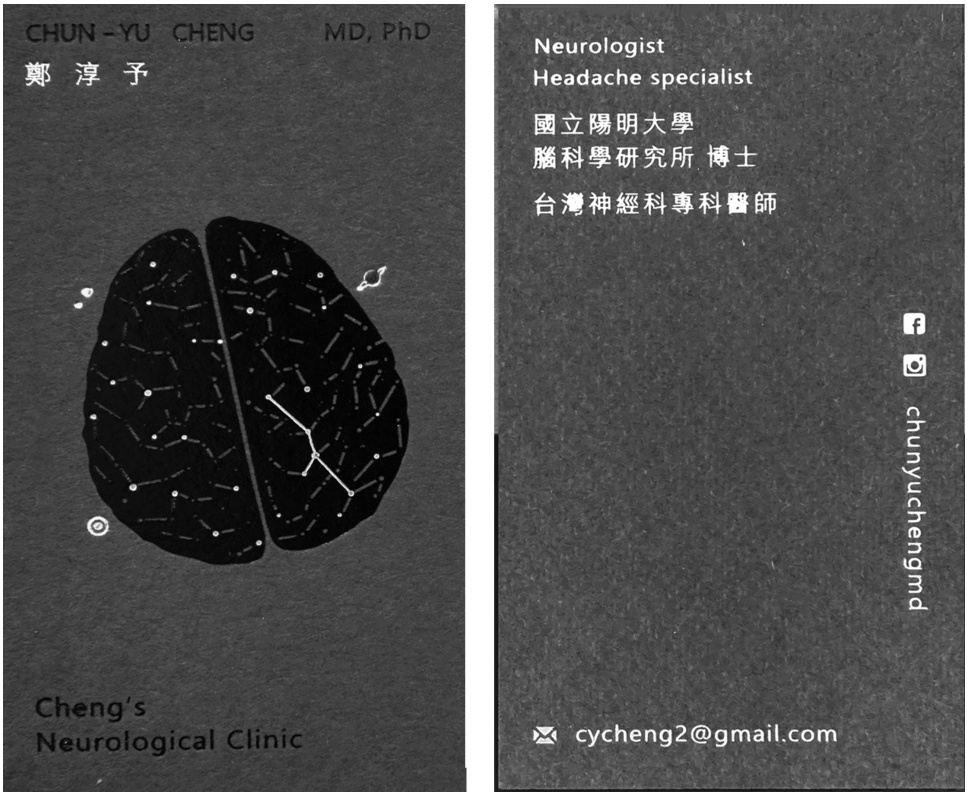


**Figure 4.4**
Elegant Design: Business Cards (Designer: Ming-Kang Lee). © 2018. Reprinted with permission.

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on the other side of the card says Headache Specialist, forming an internal bridge. The bridge is internally driven because it doesn't direct a reading and viewing order or demand that both looking and reading happen almost simultaneously. Only the turn of the card invites the parallel experience. One can look at the image first, or take in the headline, and still understand the connection.

To have an internal bridge, there must still be a connection between text and image, but it must also be loosely implied, allowing looking or reading in any order, taking in what the audience decides is relevant—missing what they decide is not. For that reason, these loose ties could result in more varied interpretations across users. The problem, if one exists, is that internal bridges make it easier for the user to engage in the modality they prefer (De Palo et al., 2012), which could miss content offered by the other modality. Allowing that cultures vary, and I am looking at this with a Westerner's mindset, seeing only the brain suggests a museum experience to me. Seeing only the words misses the personality of a specialist who would embrace that delightful graphic. But not all bridges are self-propelled. Referencing-bridges direct the experience.

**Referencing-Bridges: Referencing-Text**

Referencing-text most often starts within the body copy of a longer text. Prompts encourage the reader to look outside of the line of the text to become the viewer. These bridges are found in art history and biology texts where invitations to look are part of necessary learning. Unfortunately, the invitation to look out from the sequential units of the text to the continuous form of the image is often a mere parenthetical such as "(figure 5A)." A parenthetical, even one with an important purpose, is not a strong invitation for a task that could use one. A request to task switch from semantics and syntax to idiosyncratic, even if guided, search is not the easiest thing to do. Parentheticals can be easily ignored. Luckily, they are not the only way to create a referencing tie.

Referencing-text creates a stronger invitation to the image by developing one of three parts of speech. These are the subordinate conjunctions: *if*, *before*, or *so that*; demonstrative pronouns: *this*, *that*, *these*, or *those*; action verbs: *look*, *notice*, *find*; and modal or "helper" verbs such as *can*, *must*, or *should*.

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### Subordinate Conjunctions

Subordinate conjunctions *suggest* rather than *command*. Here the word "if" is useful.

*If* you look to the image on the left, you will see why Chris planted those . . .

By using the words "if you . . ." the subordinate conjunction creates a cordial relationship. Not all subordinate conjunctions show this kind of deference. More emphasis is likely with the words "before" and "so that" in a sentence that includes the action verb "read."

*Before* looking at the photo to the left, *read* to the end of the paragraph *so that* you can focus on the photographer's use of depth of field.

The author gives a clear direction about when to read and when to look with the expectation of improved learning by following those directions.[6]

Other subordinate conjunctions that create referencing-text bridges include *after*, *once*, and *when*, which signal when looking should happen. The prepositional phrase *in order to* provides the logic for looking.

*After* reading to the end of the paragraph . . .
*Once* you are done looking at . . .
*When* you look at the . . .
*In order to* see the bone clearly . . .

### Demonstrative Pronouns

Demonstrative pronouns help create referencing-text because they encourage the reader to look out from the text. For example:

Walker Evans took *this* photograph of the sharecropper Floyd Burroughs . . .

If the picture of Floyd Burroughs were included here, the demonstrative pronoun "this" would create a referencing-text to the photograph. But other pronouns are possible as you'll see in the next example.

*That* is a photograph of the sharecropper Floyd Burroughs taken by Walker Evans.

### Action Verbs: Commands

Action verbs used as commands are the strongest invitation to look out from the text.

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*Look* at the photograph to the left.

The word "look" is a clear command to go outside of the text and to the proximate photograph as you move from a sequential experience to idiosyncratic search. But the use of a verb as a command can also take action up a notch, as it does in the next example.

*Find the bony mass* that would suggest . . .

While the earlier command to look suggests that the audience can look anywhere in the image, the command to search is a particular and task-based option (DeAngelus & Pelz, 2009; Yarbus, 1967) with the expectation of a specific action on the part of the audience, one that images excel at providing (Schnotz & Wagner, 2018). The word "find" suggests a more careful combing through the image. It alters the general sense of looking to serve specific goals that the audience might not have appreciated without the command, which influences what an audience notices and why.

### Modal Verbs

There is a World Wildlife Fund poster that includes a simplified drawing of the ocean as it goes from one edge of the page to the other with nothing but that blue water. At the bottom are the words, "CAN YOU FIND THE WHALE?" The modal verb "can" is a helper that softens the command to "find the whale." In that design, the modal verb implies that a whale can be found. But there is no whale there, which was the point of the search. "Can you . . ." offers a question that engages the audience in reflection as much as action. A straight command would undermine the relationship with the audience by setting them up for failure. It would also undermine the purpose of the poster, which is to increase awareness and reflection on the fact that these beings are in danger.

### Referencing-Bridges: Referencing-Image

When a design employs referencing-text, the invitation to look out becomes directed. Unfortunately, the ability to find one's way back is missing, which in turn dampens the desire to move from reading to looking. Referencing-images further encourage the invitation to complete the reading to looking loop by helping the viewer know they can become the reader again.

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**The Halles de Paris** was the name given to the halls plants, market wholesale of food costs, in the heart of Paris.

within the now enlarged urban community. In Paris, for example, there is an area which, from being the **Cour des Miracles** in medieval times, later became the site of the gallows and much later again in the Paris of Haussmann was the site of **Les Halles** (the food market); this area around the Saint-Denis and Bonne Nouvelle districts has always been a centre for prostitution and other illicit commerce. Even though the Paris of today has pushed its boundaries far beyond those of the old **Saint-Denis gate**, the phenomenon still persists. The various features that characterise the layout of a city are an expression of the multifarious rhythms - however contradictory - of daily life.

The Japanese city, and in particular the city of Kyoto, was - and still is a parallel example of dynamic urban evolution. The bar districts of Gion, Ponto-cho, and Kitano, which have become centres of night life

**Figure 4.5**
Social Discrimination and Architectural Freedom (Designer: Luyao (Crystal) Xue). © 2020. Reprinted with permission.

Referencing-images, such as the highlighted text in figure 4.5, are visual elements that often work with referencing-text to complete the invitation from sequential to spatial information. In general, referencing-images show start and endpoints using a highlighted shape to give users confidence that a move from the text to the image will not result in a painful search through the body copy after viewing a table, illustration, or photograph that lies outside of the line of the text. The audience needs this encouragement because they are being asked to switch from one code to the other in quick succession. In making the move from discrete units to continuous form, we are not doing the simplest thing. And as Arnheim (1974) noted, we like to do the simplest thing. Presented with four dots, we find a square, not a face. Presented with sequential processing, we continue to process sequentially unless the motivation to do otherwise is stronger. The task becomes complicated because that easiest thing to do keeps changing. Looking at an image does not demand a particular sequence even when a specific task is

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involved. The experience is spatial, and the audience looks for spatial cues in order to consider where to look next (Schall & Thompson, 1999). On the other hand, looking at text in English relies on a purely sequential process. Each type of looking is a shift not only in the way we look but also in the system used to extract meaning. It is important to encourage this activity while acknowledging the complicated shift so that we can design a better experience. Mayer (2002) found that images should at least be near the relevant text.

To further complicate matters, as De Palo et al. (2012) note, people have preferences for visual versus textual information, making it even more important to encourage both looking and reading for the gaps in understanding that each fill. As Plass et al. (1998) discovered, learning improves when both visual and textual information are present, even for those who prefer text or image. When referencing-text and referencing-images complement each other, the design offers a stronger invitation to synthesize.

As you can see in figure 4.5, an excerpt from Fiévé's *Social Discrimination and Architectural Freedom in the Pleasure District of Kyoto in Early Modern Japan* (2002), the referencing-image, a highlight around the words "Les Halles," provides a tie to the picture and caption that is to the left of the text. It does not include referencing-text bridges.[7] Even so, moving between image and text makes sense because the referencing-image encourages the moves between following sequence and searching through form. The design's online opportunities mean that the highlight and the image of Les Halles do not appear until the user scrolls over the relevant text on the screen. To invite the hover, there is a lesser signal in the form of a fine line around that relevant textual element. On hover, the full referencing-image around the text appears. It is strong enough to make the tie clear without disrupting the experience. It stays visible until the user scrolls again. The animation increases the presence of each referencing-image. Other ties of this type include bolding the relevant text or placing rule lines as a physical link between the image and the text that the image refers to.

Referencing-text together with referencing-images offer the audience a stronger reading to looking experience, moving the image from parenthetical to equal player. But many examples of Inter-play do not depend on these longer looking and reading experiences.

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### Proxy-Bridges: Substitution-Proxy

Substitution bridges emerge when a relevant image lives in the line of the text, on a shared baseline. The image replaces or substitutes for a noun or verb but is not a synonym because it is not a word. Its spatial relationships, colors, textures, and visual dynamics mean that it will contain information not found in words. The principle of relative certainty means that the image information is something that the text would find difficult to describe with specificity. With text alone, important information would be lost.

In "THERE'S NO PLACE LIKE" (figure 4.6), Brian Singer uses a substitution bridge to bring ironic reference through the re-presentation of what is usually a tired cliché. But to see *this* place is more than ironic. The experience of seeing something that feels like it's almost habitable, and at the same time, so completely lost, is heartbreaking. The image re-presents, and while it substitutes for what would have been a single word of text, it also

**Figure 4.6**
There's No Place Like . . . (Artist: Brian Singer, @someguy.is). © 2017. Reprinted with permission.

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joins with the suggestions of safety that the word home implies. The image enhances and alters the experience of home. For most, prior knowledge would not provide enough lived experience to appreciate the enormity of a situation where so many, who are so poor, lost so much. This building captures a visual reminder that this fire is immediately devastating and will have long-term consequences. This substitution bridge shifts the emphasis from re-articulation to re-presentation without requiring the trickier move outside of the text.

Singer's installation represents the hundreds of people who lost their homes in the 2016 Mission Street, San Francisco fire. An experience of walking through the neighborhood, would have been one of discovery as buildings revealed their damage to the people who lived there. As Inter-play, that damage helps to form a conclusion. The angle chosen for this photograph matters because so many angles were available. From the side, the building is falling. From the front, it could still be home. Those two angles suggest what the newly homeless might experience—the feeling that maybe it's not going to be so bad, and then in the walking around, revealing that it's even worse, providing evidence that needs to be emphasized and specific. Even the text. "there's no place like, was typographically structured as evidence. The letterforms emerge from 1,800 pieces of plastic to memorialize how the fire might have started when cigarettes or charcoal were thrown into plastic garbage cans.

The complexities of home become more tragic when the people who lived there add their stories and become a part of an over-time environmental experience within an installation that had beginning and endpoints. Outside and within them, the publication *Firehouse* (Dineen & Schultz, 2016) reported not only on the scale of the fire but also on some of its victims. Joe Williams's experience adds to the sadness of this situation. One of many people in that area who lived with housing insecurity, Williams states: "I just got out of being homeless, of moving from place to place, and here I am again."

The cliché, "there's no place like home" invites archetypical imagination—a curated view. Singer's work means that what we imagine will now expand to include this growing knowledge. Just as this burned-out view of home was not previously part of the archetype and needed to be seen, designers must decide when imagination is sufficient and when it is not. They must ask the question, is my audience a competent collaborator who can imagine the enormity of this situation? Imagining the visual through

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the textual can leave us in an all too comfortable existing context. A report of the fire in that community might trigger the reader to imagine "tenements," which removes the connotations of home and negates Singer's intent. An image alone has many possible interpretations. By employing substitution-proxy, Singer opens our concept nests as he makes us witnesses to the enormity of what was lost. His use of the proxy-bridge prevents the audience's imagination from coming to incorrect conclusions about the depth of the damage or the fact that these were homes. It is the first of two proxy-bridges.

### Proxy-Bridges: Repetition-Proxy

Repetition-proxy occurs when an image repeats the text. Some repetitions are of more consequence to an individual. Consider:

> I just painted my living room *walls*. You should see this *muted green*.

But what is the specific hue? The words below will not offer sufficient clarity.

> I just painted my living room walls. You should see this Sea Salt.

While more specific, it is less descriptive. Add a chip of the actual color, and the new information narrows the generic idea of greenness. While the text alone encourages imagination that leads to individual versions of the color, repetition-proxy would define it (assuming that the audience is not color blind).

Unlike substitution-proxy, repetition-proxy does not have to live in the line of the text to repeat and clarify textual information. Consider two ways of inviting the novice into an experience. With text alone, an institutional email might state:

> Ebru is a Turkish painting technique. If you've never seen how it's done, come to the Green Spine this weekend to admire our student examples.

The word Ebru will be meaningless for anyone who is not familiar with the technique. The second sentence tells us that the intended audience is the novice who might appreciate looking at novice work. But how are they to know? A repetition bridge would attach more meaning to the term "ebru."

The electronic text would not reference the example (figure 4.7). The image forms a repetition-proxy with the word "ebru," clarifying a technique that would now be more familiar ("I've seen that in the endpapers of

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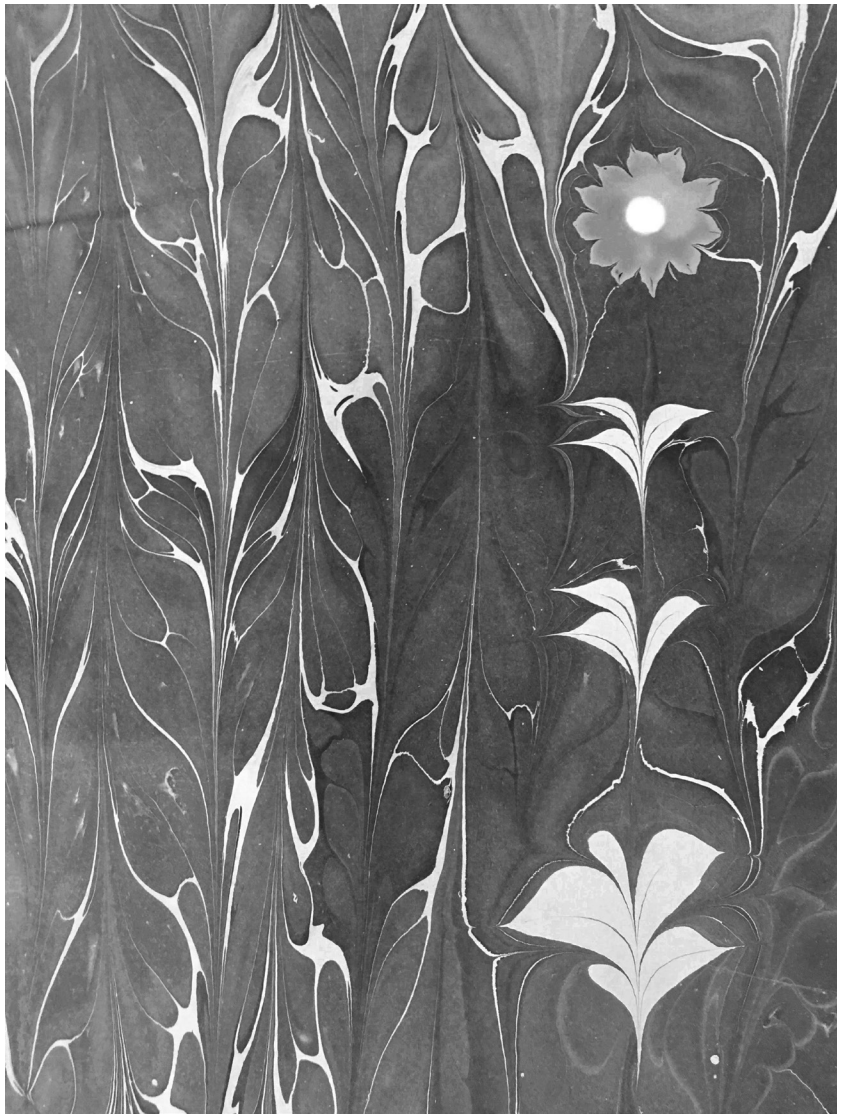

**Figure 4.7**
Ebru (S. Hagan). © 2019.

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old books") while remaining somewhat unfamiliar ("I thought you could only make patterns, not pictures").

But more than simple recognition was at stake in the World Wildlife Fund poster from the introduction, "I Am Not a Rug" (figure I.3). In that case, the repetition-proxy uses the pronoun "I" to verbally repeat the representation of the tiger. It is a surprising revelation to see an animal declaring its agency.

Unfortunate consequences can occur when the meaning potential embedded in spatial relationships goes missing. All hurricanes have names, and in fairness to gender, male-sounding and female-sounding names alternate. But there is an unintended consequence because hurricanes with female names are not taken as seriously as those with male names, leading to more deaths when storms with female names touch down (Jung, Shavitt, Viswanathan, & Hilbe, 2014). Hurricanes like Rita in 2005 might trigger an archetype either less prone to rage or less able to deliver it. Rita's bite was much worse than her name suggested. If an image of a hurricane with a female name tied to the text by way of a repetition bridge, new associations might replace problematic bias.

### Pairing-Bridges: Coupling-Pair

Pairing-bridges are unlike proxy-bridges in that one modality does not stand in for or repeat the other. More than any of the other bridges, pairing-bridges interconnect image information that holds part of the thought with language that completes that thought with a minimal amount of text. Editing the text to its essentials is a necessary feature because the visual/verbal message that these ties encourage must communicate as a singular concept.

Coupling-pairs bind messages of equal visual weight, immediately showing their collaborative nature. Consider a website called slaveryfootprint .org that asks the question, *How Many Slaves Work for You?* It is a short question that in isolation suggests a dark world that we would think we could not possibly inhabit. In that dark world, people might not see themselves as the intended audience. This site addressed both the problem of the dark nature of the topic and audience denial by including a coupling-pair that joined the visual and textual partners. The text pairs with a visible but unlikely chain on each side of the words. This chain is unlikely because it looks as if it is made from colorful construction paper with the bright colors

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of happy childhood experience. Synthesizing two areas of prior knowledge, memories of childhood with knowledge of slavery, creates a contradiction as well as a way into the experience. The paper chain is on a diagonal, and in the middle of the screen, interrupting that chain, the sentence, "How many slaves work for you?" appears in a brightly colored humanist serif type. Framing the problem in the form of a question and adding visual information that contradicts the text makes the question less damning, moving the concept of slavery away from an idea that is too difficult to contemplate or "not relevant to me." While lowering our defenses, a longer trip through the site textually explains and visually shows that we fail to see individuals that we don't interact with as full human beings. They are paper cutouts, two-dimensional suggestions of a horror where we think we care about people but might care more about our own iPhones and Nikes.

In another example from the Herb Lubalin International Student Design Competition, John C. Youngberg (1986) designed *Your Move* (figure 4.8), also inspired by Jonathan Schell's book *The Fate of the Earth*. Youngberg used a coupling-pair so that a tic-tac-toe game can invite the audience to consider the implications behind two choices represented by earth and bomb. The text invites the audience to finish the thought. The words "YOUR MOVE" bridge to the game, which will end once someone selects X or O. While the choice might seem to be an easy one, our history, which includes nuclear tests and the bombing of Hiroshima and Nagasaki, suggests a difficult decision. The options then become versions of what makes us feel safe. This coupling-pair relies on that important empty space between the two bombs in the bottom row. The words "Your Move" could fill that space almost completely. But they stay outside of the image area, inviting a response. None of the elements overlap, but are close enough to couple, suggesting a strong interpretive relationship and audience interaction.

### Pairing-Bridges: Intersecting-Pairs

Intersecting-pairs bind image/text messages of unequal visual weight, often creating misdirection. This example of complementary meaning from Cordaid (figure 4.9) shows a woman on the savannah looking like the next step in the evolution of fashion photography—until you see the smaller overlapping text. The text redirects the reason why we should be interested in her and her handbag. Looking at her face would be likely as humans love

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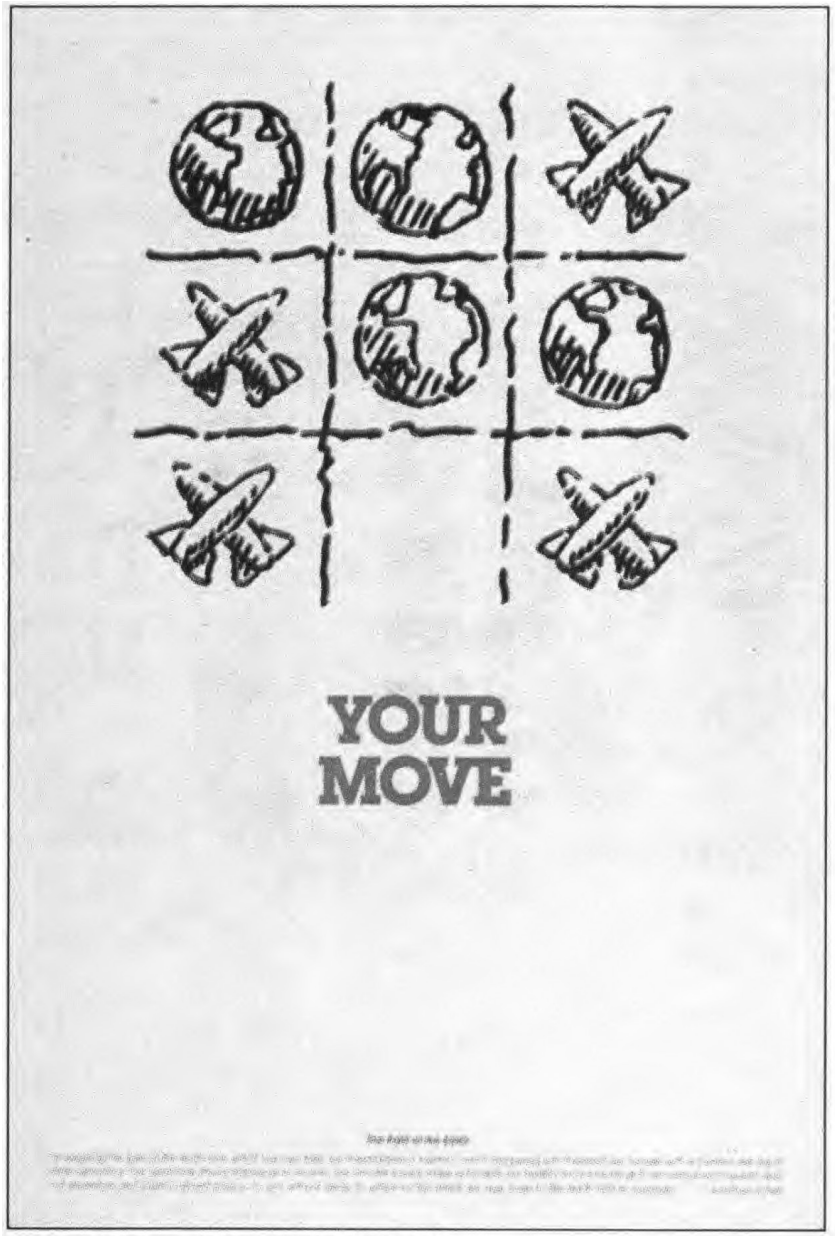


**Figure 4.8**
Your Move (John C. Youngberg, *U&lc*. Selected for the first Herb Lubalin International Student Design Competition). © 1986. Reprinted with permission.

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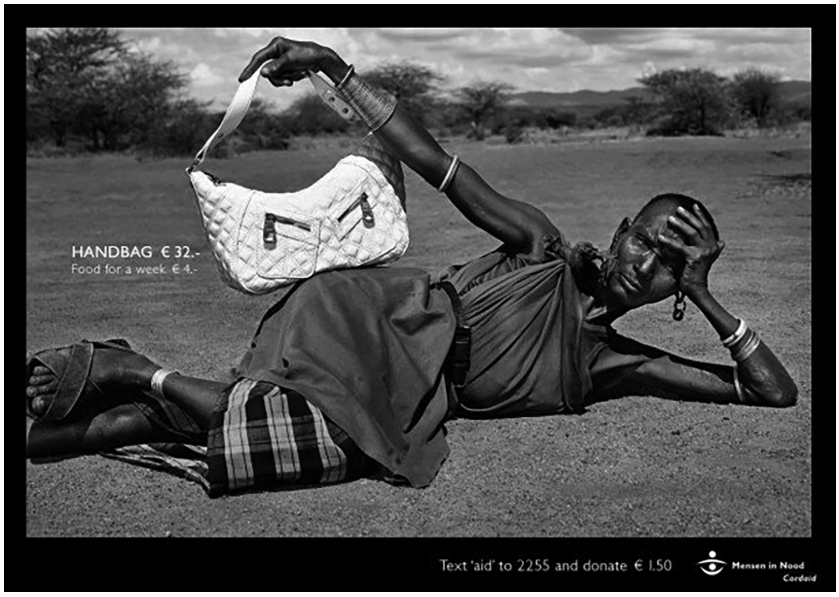


**Figure 4.9**
Small Change, Big Difference (Creative Director: Magnus Olsson; Copywriter: Saatchi/Saatchi Tribe; Art Director: Saatchi/Saatchi Tribe, Tim Bishop; Photographer: Calle Stolze for Cordaid). © 2007. Reprinted with permission.

to look at the faces of other humans (Arnheim, 1974) and have a specific area of the brain for that purpose (Parvizi, et al., 2012). The white handbag because of its high contrast within the image is, like the face, something we would see and that she is "merchandising." The expected associations only change because this intersecting-pair intends to link fashion to a human price that is higher than the handbag. The message created by this intersection is complete after reading "Handbag 32 Euros," with fine print that states, "Food for a week, 4 Euros." The diminutive size of the more important cost reminds us of our misplaced values. She is a real person who needs food. But to make us see it, she needs to tap into high fashion tropes that show and tell us how shallow our interests have become. The call to action is at the bottom of the poster with the words "Text 'aid' to 2255 and donate 1.50 Euros. People in Need. Cordaid," which is pocket change for many.

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## Summary

To create complementary meaning, Grouping and Bridging Ties must bind dissimilar structures and functions. There are five categories of Bridges: mergers, implied-bridges, referencing-bridges, proxy-bridges, and pairing-bridges. Within each of those categories live the ten specific bridges. Merger bridges split into merger-blends or merger-masks and are the tightest connections between image and typographic shape and its embedded textual content. Implied-bridges include both external-implied that bind prior experience to the design, and internal-implied that invite looking and viewing at one's own time and pace as fuller understanding emerges. Referencing-bridges include referencing-text that suggests we look out to particular information in an image. Their visual complement is the referencing-image that maps the viewer out from the text and back again. Proxy-bridges include substitution-proxy where images substitute for text to communicate important information in spatial relationships, objects, colors, and textures. Repetition-proxy repeats language with an image that adds new information not available in the text. Pairing-bridges include coupling-pairs and intersecting-pairs. Coupling-pairs appear when a functional relationship exists between an image and a phrase or sentence that are visual equals. The pair emerges either through proximity or overlaps. Intersecting-pairs bind image/text messages of unequal weight, often creating misdirection. A potential relationship must be evident, or these will communicate as non sequiturs or decorative Inter-play.

Combinations of Grouping and Bridging Ties result in the four loose to tight unions of Inter-play, the topic of the next chapter. Inter-play makes complementary meaning possible. However, loose to tight relationships can exist between image, text, and typeface without rising to the level of the clarifications, contradictions, and challenges found in complementary meaning. These non-probative types include non-sequitur, decorative, truthy, feely, and fantasy Inter-play. Probative types include reinforcing Inter-play where assumptions are simply confirmed and complementary meaning. Whether they become probative or non-probative, the loose to tight types examined in the next chapter are parallel-play, sequenced-play, inter-weaving, and symbol-bond.

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# III Unions to Outcomes: Inter-play as Complementary Meaning and an Untapped Opportunity

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# 5 Inter-play: Grouping and Bridging Ties Create Loose to Tight Unions

> The unions of Inter-play are chameleons. One union could produce mere juxtaposition while another triggers reflection and critical thought.

The combinations of Grouping and Bridging Ties that create the loose to tight unions of Inter-play can take on many guises, from the perplexing effect of the non sequitur to the processing ease of the truthy to the probative achievement that is complementary meaning. Regardless of effect, all these outcomes emerge within the four loose to tight unions that Grouping and Bridging Ties produce. Those types cannot be the product of throwing a dart at a list of ties and pairing the winners. For example, an explicit trail does not pair with an internal bridge. The first is a tight tie that does not forecast the looser collaboration suggested by an internal bridge. This chapter will lay out which Grouping Ties collaborate with which Bridging Ties, leading to the loose to tight relationships they produce.

Figure 5.1 displays the categories of Grouping and Bridging Ties capable of building four loose to tight unions. Depending on the ties employed, the four possible unions have as their tightest and loosest options: symbol-bond (the tightest) and parallel-play (the loosest). Sequenced-play directs us from reading to looking and lives in a middle ground between loose and tight. As chapter 7 will show, sequenced-play has untapped potential for future exploration not suggested in this chapter. Finally, inter-weaving, another tight relationship forms from limited image and text elements. Unions of Inter-play shows the four unions listed on the right side. The Grouping Ties that inform each type are shown on the left along with the subcategories and the varieties within each subcategory. The Bridging Ties, also with their subcategories and varieties, are to the right of the Grouping

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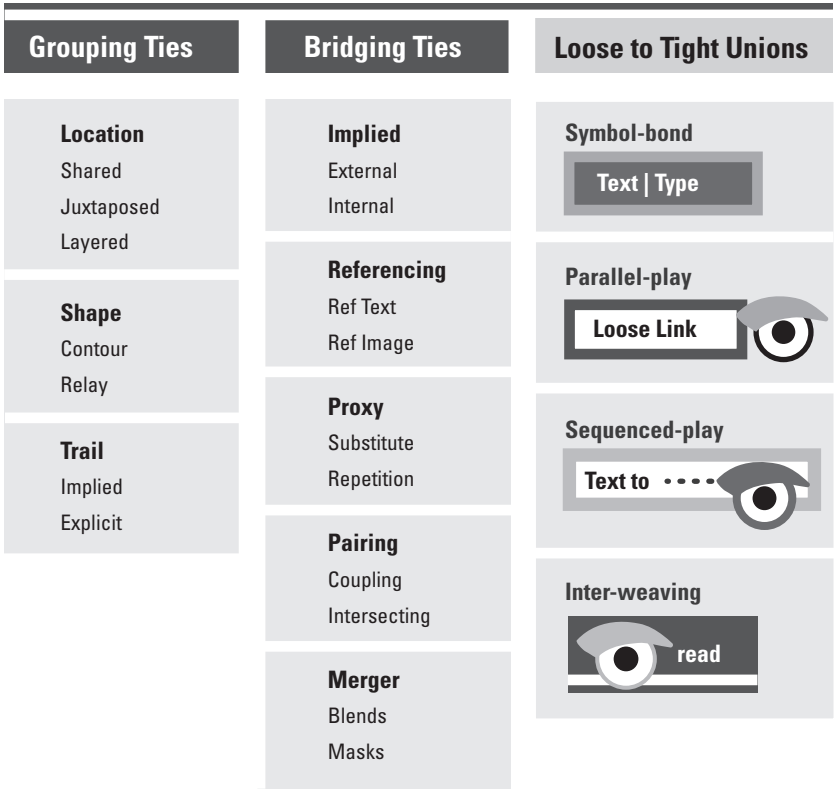


**Figure 5.1**
Unions of Inter-play (S. Hagan). © 2021.

Ties. As I introduce each union of Inter-play, a new figure will highlight which Grouping and Bridging Ties can create it. When a specific tie is not relevant to that union, it will be less visible. In other words, subsets of ties are visually separated to show the specific union each helps to create. Some ties create more than one kind of union. For example, the Bridging Tie, repetition-proxy, can produce both sequenced-play and inter-weaving depending on the other ties involved.

Some peculiarities of the Grouping and Bridging Tie interactions are as follows. A single Grouping and Bridging pair that creates one union of Inter-play, such as sequenced-play, cannot create a second union, such as parallel-play. It makes sense that a combination of ties that creates the tighter interaction of sequenced-play could not also create the loose

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interaction of parallel-play. Parallel-play provides the global opportunity to look and read at your own time and pace while sequenced-play provides local encouragement to look out at a particular moment from a longer text to engage in visual search attached to spatial relationships, before coming back into the sequence of textually discrete units. One caveat to this is that an experience that begins as parallel-play can, as one continues through it, engage in a moment of sequenced-play. An art history book's first page might not direct the eye until the reader is deeper into the chapter.

While a pairing of Grouping and Bridging Ties cannot create two different loose to tight unions, a single Grouping or Bridging Tie can contribute to multiple types. Compare the use of a referencing-text tie in two examples. In the first, sequenced-play invites the reader to become the viewer by commanding "(See figure X)." The parentheses are a low-level explicit-trail, a Grouping Tie that marks the path (admittedly not an effective use of this tie). The Bridging Tie within the parentheses is the command to "See." It is a referencing-text tie. "Figure X" itself is repetition-proxy. The explicit-trail tie "( )" collaborates with the referencing-text tie, "See," to create the new sequence. The next example also uses referencing-text but has no explicit trail.

René Magritte's 1929 painting, *The Treachery of Images*, contains an image of a pipe with the short sentence "ceci n'est pas une pipe" (this is not a pipe). This is an example of inter-weaving, a tight relationship between limited image and text elements. Magritte's work also employs a referencing-text Bridging Tie created by the demonstrative pronoun "ceci" (this) that points out to the painted pipe. But its Grouping Tie is juxtaposed-location. The image and text are close together. In Magritte's painting there is no explicit-trail. Inter-weaving makes that unnecessary. In (See figure X) there is no juxtaposed-location tie. The image that "See" references could be on a different page. But both make use of the referencing-text tie.

The available ties for each type reflect their basic loose to tight purpose. Symbol-bonds need the Grouping Tie shared-location to bind with a merger-bridge to create the tightest relationship possible. The very different experience of parallel-play needs ties that allow an interaction where images and longer expanses of text have loose but available bonds. For that reason, they are structural naturals for juxtaposed-location Grouping Ties and the looser meaning relationships offered by internal-implied Bridging Ties. Internal-implied means that the bridge is within the design rather than externally located in the mind of the audience.

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In parallel-play, users who might benefit from looking and reading, but prefer one over the other (De Palo et al., 2012), can focus on the modality they desire. That can be a problem when both modalities offer necessary information. Modality preferences are one challenge that sequenced-play addresses. To improve learning outcomes, sequenced-play must find the right ties to invite the reader to become the viewer (and vice versa) in the service of a directed experience. Finally, inter-weaving's tight relationship employs a limited set of word/image information to offer a big picture take on a process or problem, which can provide an opportunity for further reflection, critical thought or action. Inter-weaving needs strong close bonds.

It then stands to reason that while there are ten Bridging Ties and seven Grouping Ties, there are not seventy different combinations. Symbol-bonds exist in all types because text/typeface is a defining aspect of Inter-play, but shared-location groups and merger bridges apply only to the text/typeface relationship. The next sections go into more depth on each union, often using an example to show a subset of the tie combinations that union represents. It is important to note that most of these examples are complementary meaning outcomes. But many outcomes are possible from non-sequitur Inter-play, a union without a Bridging Tie, to the problematic truthy. I do not focus on those. The mission of this book is to focus on the opportunities for claims to have reasons and/or proof when image and text are both key contributors.

### Symbol-Bond = Shared-Location Groups + Merger Blend or Mask Bridges, supported by External-Implied Bridges

When the Grouping Tie, shared-location, and the Bridging Tie, the merger-blend, combine, text and typeface form the union symbol-bond. Symbol-bond is the tightest union because the photons, the visual information in the typeface share a location with the phonemes, the sound of the text. Sight merges to sound even when that sound is internal to the reader. In this type of Inter-play, shared-location must always exist, and merger-blends will also be involved unless the Bridging Tie is intentionally damaged as it was in Loesch's work when text went through the shredder (chapter 2). Masks can replace the blend when an image lives within the letterforms. Along with the merger-blend, the external-implied bridge binds the meaning embedded in typeface shape to prior knowledge that the audience

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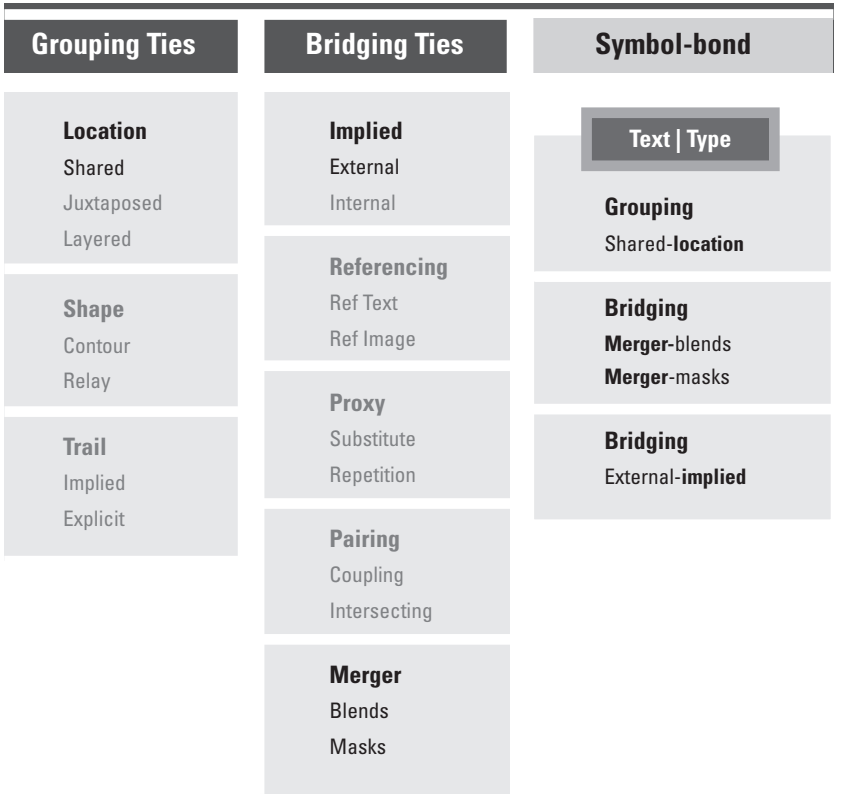


**Figure 5.2**
Symbol-bond (S. Hagan). © 2021.

brings to new experiences. On the one hand, prior knowledge affects most types of Inter-play by default. But on the other, the external-implied bridge should be a designed tie, mined for a purpose.

In symbol-bond unions, the bridge, the merger-blend, binds the meaning in typeface shape (Doyle & Bottomley, 2009) with the semantics and syntax of the text. In other words, merger-blends are functional interactions between space and sequence. The merger-blend puts the focus on function, while shared-location ties remind us that the text, with its discrete units, and the typeface, with its continuous shape, are different elements occupying the same physical and metaphysical location.[1] To have a symbol-bond is to have merger-blends or masks and shared-location. Greeking can sometimes undermine this process.

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Greeking creates placeholder text that does not contribute meaningfully to the final design.[2] It expresses the structure but not the function. That a structure exists is critical to the visual composition, but with only half of the interaction in place, the work does not convey its final purpose (unless it's part of the discussion on the value of noticing.). Placeholder text represents but does not re-articulate in a way that would make sense to us or the design. Greeking offers another reason why shared-location cannot be conflated with the merger-blend. Structure and function are two distinct elements of symbol-bonds that invite us to focus on two importantly different aspects of the interaction.

Once Greeking changes to purposeful text, the merger-blend returns. When both typeface and known text share the format, merger-blends put sequential function together with spatial function, while shared-location puts continuous structure together with sequential structure. Shared-location and merger-blends produce the tightest and most ubiquitous form of Inter-play—but that does not mean ordinary.

## A Closer Look

In "Isolationen" (German for isolations), Ott + Stein employ shared-location and merger-blends, and perhaps more importantly, design external-implied bridges that use negative space shape in a way that makes this poster almost heartbreaking (figure 5.3). To start with the basic ties, shared-location produces two different structures of language linked to typeface. The words on the left and right group and bridge through their sans serif face. Hand-drawn text in the middle groups and bridges "Isolationen." Hand-drawing magnifies the feeling of difference through its individualized form. The feeling of the human who made those shapes lives embedded within those forms. Outside of this poster's context "Isolationen," according to worldofdictionary.com (n.d.), means separation, solitude, aloneness, or quarantine, which depending on the situation could feel individually painful or desirable. There are many reasons for the experience of either standing away from the crowd or not belonging to it. In this symbol-bond union, the text to the left and right, and the surrounding negative space expresses which of those feelings apply.

To the left and right sides of the poster are the formal machine-made sans serif letterforms. In those spaces, the merger-blend ties typeface to simple

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**Figure 5.3**
Poster for the Berliner Kammeroper, "Isolationen" (Designer: Bernard Stein). © 1981. Reprinted with permission.

facts. It tells us what we need to know to attend an event associated with the Berliner Kammeroper. The text says nothing specific about the experience of being isolated, but the typeface does. Every letter looks the same as every other letter. The sans serif type fits in together, forming a kind of clique. That strong sense of uniformity emphasizes the difference between these two groups and the central word. The letterforms set the stage for the physical manifestation of a particular sense of isolation, one where the isolated not only does not belong but also has become someone the group actively avoids.

In lesser hands, this work might do nothing more than reinforce a common exercise in typography classes to make the word look like what it is. But Ott+Stein tap into the negative space shape in ways that add deeper meaning linked to the idea that we need not be that far away from others to feel completely divorced from them. Evidence of this conclusion lies in the external-implied bridge.

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Ott+Stein create a stronger sense of isolation because of how they designed that implied bridge. Two decisions make this work stunning. As already discussed, the typeface for the word Isolationen is unique to the person who drew it and only found in one area of the poster. But it is also not quite level on the baseline, showing that even on the most basic level, it does not fit in with the uniformity of those around it. It is not only out of place, but also off kilter. A unique face like that could still be a positive in that it has the top spot in the hierarchy. But that is not the case here because of how the two groups of smaller text are positioned. Those two columns on the left and right are not that far away. Yet, like passengers on an elevator trying to get space from one of the riders, the sans serif letterforms move into the margin as far as they possibly can. Isolation linked only to physical distance would have placed the informational text at the top and bottom, enlarging the distance to a more comfortable position, leading to two possible conclusions. In one case, isolation could be more like quarantine and end once everyone could be together again. In another, the two typefaces could represent different communities where cultures hold together. Instead, the designers create a far more poignant study by keeping the smaller uniform text nearby, while also pushing it to the right and left as far as it can go. The left and right alignments of those two narrow columns of text also show the desire to be as far away as possible. It is amazing that the simple act of placing text in two long columns that hug the left and right sides could suggest so much. Those smaller words would move out into space if they only could.

The external-implied bridge that these designers created illustrates the difference between physical versus emotional distance. This poster offers re-presentation through spatial relationships that is knowable and heartbreaking. "Isolationen" shows how typeface and location, both in the letterforms and the negative space shapes, can affect the meaning of words just as words affect the interpretation of typeface. When these meanings influence one another, the experience of references and associations between the two rises to a level that engages reflective thought. Isolationen provides a sense of the experience that a word or a person who was even more isolated could not. It shows that a realistic image need not be involved for Inter-play to have probative value. Examining shape differences and spatial relationships, including those relationships in the negative space shapes, provides a way to decide if the experience rings true.

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### Parallel-Play = Juxtaposed-Location, Possibly Contour-Shape Groups + External and Internal-Implied Bridges

With the addition of images, other types of Inter-play emerge. The loosest is parallel-play (figure 5.4). As noted earlier, parallel-play invites an audience to look or read at their own time and pace. Unlike symbol-bonds, where type and text share the same space, in parallel-play the looser ties span a wider gap between text and image that hold these unlike elements together. This union needs one or both of the following Grouping Ties: juxtaposed-location ties form when image and text are physically close together, and contour-shape ties sometimes emerge when image and text have similar outside contours.

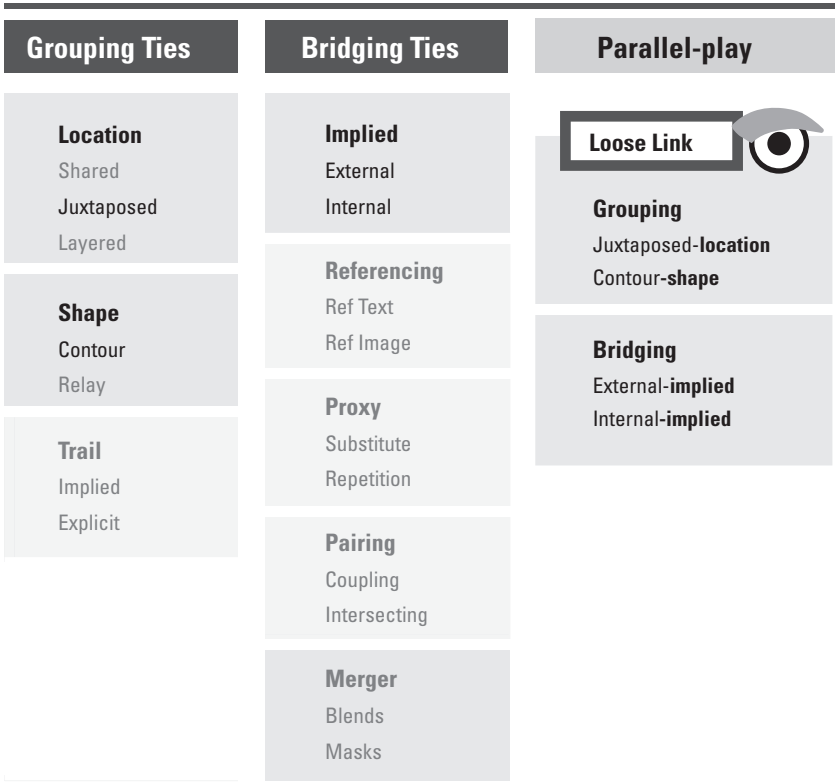


**Figure 5.4**
Parallel-play (S. Hagan). © 2021.

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While parallel-play can make use of two Grouping Ties, its functional nature links to only one Bridging Tie, the implied-bridge. An internal-implied bridge is a necessary functional connection that suggests an interaction between larger sections of text and one or more images within the format. The internal-implied bridge is a relationship where image and text are meaningfully related, but not specifically connected. Text never refers out to any specific images at any particular points in the reading. If there are references out to the image at a specific point in the text, that would suggest a sequence, another kind of play.

If the only ties holding the work together are Grouping Ties, if potential interpretive relationships are not present, Bridging Ties won't form and one of two outcomes will result: non-sequitur Inter-play or decorative Inter-play. Grouping Ties without any form of Bridging Ties might produce individual speculation, but that speculation will not be shared by a larger audience.

To identify excellent examples of parallel-play, we need look no further than the work of Müller-Brockmann, the father of the grid. Müller-Brockmann created grids formed from smaller modules bound by columns and rows. The modules and combinations of modules that create spatial zones, offered opportunities for images and text to mirror the same dimensions. Sections of image and text fit the same sized modules or spatial zones. An example of this mirroring is in chapter 3, page 92 (figure 3.8), in the work of Jimmy Zeng who mirrored space to house text in an online environment that reveals the value of contour shapes.

Müller-Brockmann championed visual focus as the grid designer's primary concern, one where the designer stays out of the argument. From his perspective, text lives in a presentation space, and if all goes well, the visual form should not greatly affect the content (Schwemer-Scheddin, 1995). However, research on typeface connotations (Doyle & Bottomley, 2006, 2009) suggests that neutrality is not possible. Müller-Brockmann's visual elements communicate a clarity that cannot help but anticipate the same level of corporate organization within. The use of a clean sans serif typeface communicates a sense of precision that another selection might not convey. Clean spatial zones and modules lead to organized visual/verbal engagement that is more than a container. The manuscript grid in the next example (figure 5.5) offers online engagement that suggests how much is possible in this loose type.

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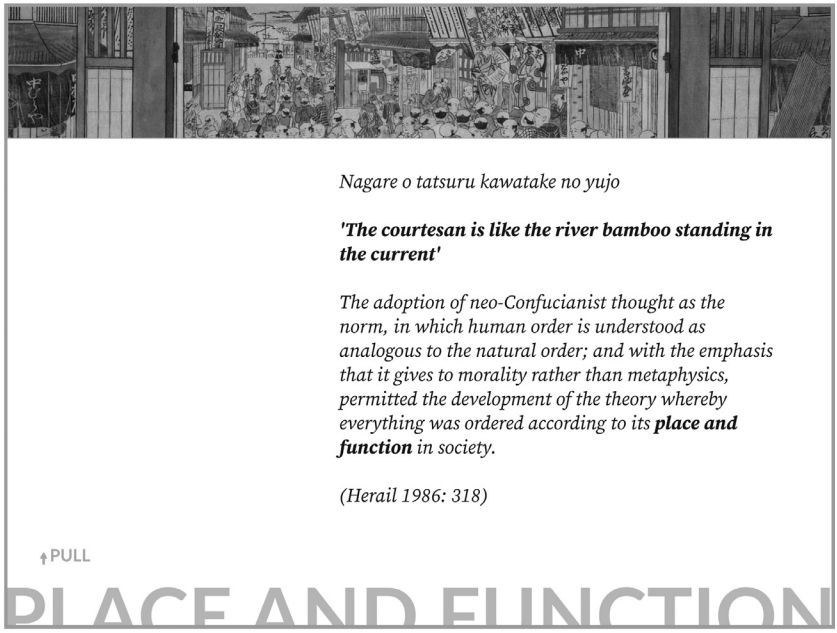
Nagare o tatsuru kawatake no yujo
'The courtesan is like the river bamboo standing in the current'
The adoption of neo-Confucianist thought as the norm, in which human order is understood as analogous to the natural order; and with the emphasis that it gives to morality rather than metaphysics, permitted the development of the theory whereby everything was ordered according to its place and function in society.
(Herail 1986: 318)
PULL
PLACE AND FUNCTION

**Figure 5.5**
Social Discrimination and Architectural Freedom (Designer: Luyao (Crystal) Xue). © 2020. Reprinted with permission.

## A Closer Look

Parallel-play is common, but in this case, common does not mean ordinary. Figure 5.5 created for online viewing as the "pull" feature suggests, illustrates its elegance. This work invites looking or reading by giving each visual and textual space its own area while unifying the three main areas—image, body copy, and headline—within that compositional space through juxtaposed-location Grouping Ties and internal-implied bridges. Through a pseudo contour-shape, the image at the top groups and bridges to the words "Place and Function" on the bottom. The Grouping Ties that bind top with bottom allow those two major elements to nest the body copy within. The ochre color of the headline echoes ochre in the image. The body copy nested within the center space is loosely bound and does not have smaller-grained sequenced interactions within the text, but the sequencing command to "pull" does suggest that not all unions have completely clear divisions. One must sometimes look for dominance in making the decision.

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In Xue's work, the designer employs an illustration that presents a world that we experience both as we see it, and as we imagine it in terms of what it represents. In this way, the illustration contributes and holds back information. It represents the pleasure district of Kyoto, named on a prior screen. The district becomes known through this image while remaining a mystery because of its stylized view. The style that helps link this information to a specific place at an earlier time contributes a sensibility that represents a mystery. Because so much remains a mystery, the words "Place and Function" must bridge to the image to understand the author's purpose. The large words emphasize the invitation to consider how "Place and Function"[3] connects to the image. Learning more can only be found in the body copy nested between them, which is made more inviting through the separations and callout quote. How place and function informed life needs the details of the text. But both text and image need to bridge, or the sensibility of place and function are lost. By including an image, not of the district as it actually looks, but as an artistic invention, the design sets the pace to learn more about the function without dictating a sequence.

Implied bridges can be a problem because they do little to challenge modality preference, allowing individuals to miss the rich possibilities offered by the other modality. Xue's work takes advantage of the online opportunity to present smaller sections of text to encourage both looking and reading so that an audience won't miss out. Because this interactive piece reveals and hides parts of the top and bottom as the user drags the image up, there is a stronger prompt to look at the headline for its image qualities, to appreciate its form, and almost accidentally read it. Even so, an ongoing problem for parallel-play is that these loose ties can result in more varied interpretations across users who don't fully look and read. While image/text selections and the hierarchical bolding of body copy invite reading in Xue's piece, interaction often needs to be tighter to produce other complementary effects. One way to do that is to create sequenced-play.

**Sequenced-Play = Implied-Trails or Explicit-Trails + Referencing-Text and/or Referencing-Images or Substitution-Proxy or Repetition-Proxy and External-Implied Bridges**

At first glance, sequenced-play can look like parallel-play. The change to sequenced-play happens with an invitation to look out from the text to an

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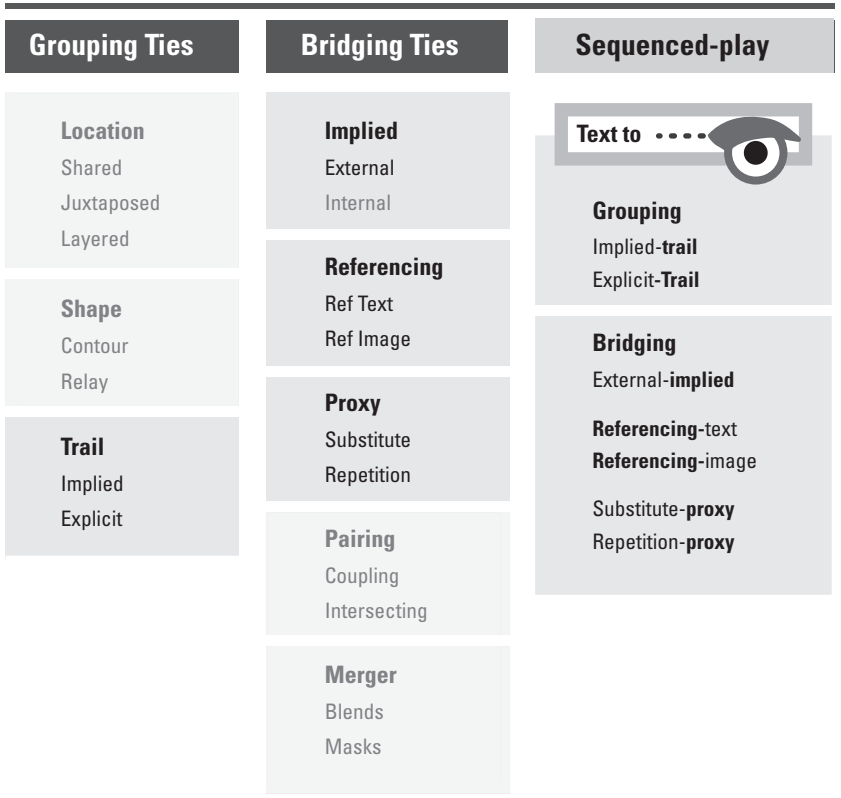


**Figure 5.6**
Sequenced-play (S. Hagan). © 2021.

image or chart. As always, this form includes the Grouping and Bridging Ties needed for symbol-bonds because every type of Inter-play includes text and typeface (figure 5.6).

Sequenced-play invites a direct move from text to image or image to text at useful moments in the experience as the need for re-articulation changes to a need for re-presentation brought on by the principle of relative certainty. In other words, text bumps up against its inability to communicate specific spatial relationships, colors and textures making it necessary to invite the audience out to relevant spatial information. Images in turn have their areas of relative uncertainty that make it important to go back to reading again. Sequenced-play lives in genres where information cannot be limited to statements, questions, and demands or spatial relationships alone. Unfortunately, many sequencing invitations are not effective

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invitations to look out to the image, and they do not usefully map us back to the text. Therefore, sequencing elements need to be studied not only for what has been done but also for what is possible in print and electronic media because changing focus from sequence to continuous space is easier when Grouping and Bridging Ties create effective structures with functions that encourage the switch.

### Explicit-Trail Groups Combine with Repetition-Proxy Bridges

In sequenced play, an explicit-trail can physically mark the text to encourage a mental shift in where, how, what, and why we look. Creating these explicit-trails is on one hand as simple as including (parentheticals) in the body of the text. But a parenthetical is not an effective invitation out nor an effective opportunity to find one's way back to the text. Schnotz and Wagner (2018) point out that the linear structure of a text impedes search. In all those words, the ineffective parenthetical undermines the function of the information inside. The information inside the parenthetical (figure "X") is a repetition proxy. It is the proxy for the image it repeats. We need to see "figure X" whatever it might be, but parentheticals are easily ignored. The journey out of the text is not easy. The journey back will be even harder.

This nesting of parentheticals has the audacity to suggest that we quit doing the simplest thing, following the line of the text, and make a significant mental shift to idiosyncratic looking. And then once done, try and search for the place in the text where we had been, knowing that it's harder to find textual information through search. It's like a scavenger hunt with no prize. The ( ) is the subtlest of explicit trails providing a moment of "no way am I doing this." Consider this example.

In the book *Drawing* (1980), Mendelowitz, its author, unsurprisingly signals that the reader should, at particular moments, become the viewer. But the invitation is inconsequential. Consider that invitation when the author states: "'The Drummer' by Piazetta reveals an almost caressing tenderness of touch in its carefully modulated tones and soft smudges of chalk (figure 16.16)" (p. 84).

The repetition-proxy, "figure 16.16," is the stand-in for "The Drummer" that the reader now needs to seek out. The image Mendelowitz asks us to look for does not fit into the structure of the paragraph or even the current

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page. The parenthetical on page 84 is not encougaging. As vocabulary.com (n.d.) states, "while parentheticals *aren't the most important ideas*, [emphasis added] they help support those ideas." In a book about drawing, the drawing is the most important idea. And the most important idea is on *page 386*. In this instance, parentheticals and page distance problems suggest that moving from sequential to spatial processing is not worth it, making the drawing the least important part of a book focused on analyzing and critiquing spatial relationships. Mendelowitz tells us about "the carefully modulated tones" (p. 84), a note that requires we see proof in the drawing, but readers pressed for time might imagine modulation rather than view it. Of course, the problem is that words describe but cannot re-present the modulated tones because that is language's area of relative uncertainty. Those who do hunt out page 386 will need to remember where they were and thumb back to become the reader again. When these long distances must be covered, a barrier to information seeking goes up. The value of time (Wilson & Walsh, 1996) comes into play, which might or might not be overcome by curiosity or modality preference. While the example is extreme, it is not uncommon. Of course, there are production costs to consider that limit some options, but some improvements have begun.

### Improvements to Sequenced-Play

In Meggs and Purvis's *History of Graphic Design* (2011), we still find (figure 1–14) standing in for "The Blau monument," but the authors strengthen the invitation to look out by bolding **1–14**. The bold repetition-proxy creates a stronger functional bond with a better explicit-trail that gives the reader a fighting chance. The spot of contrast aids search. This approach is not new, but this is a good example of it.

### Adding Referencing-Text

When an image lies outside of a paragraph, a command to look adds an additional bridge in the form of referencing-text. "(**See figure 1A**)" slightly strengthens the invitation by combining a command (referencing-text) with repetition-proxy and **a bolded** explicit-trail, improving the invitation, but not yet engaging with the inventive possibilities that sequenced-play

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can offer. A better invitation emerges when those visual cues are stronger, as they are in the next example of an online grid.

### A Stronger Invitation: The Explicit-Trail Group + Referencing-Image Bridge (on Hover)

In figure 5.7, electronic media uses "on hover" to offer another opportunity for an explicit-trail to combine with a referencing-image bridge. It does so by changing color when the cursor hovers over the text, "Ming-Kang Lee." The color change signals an invitation to click. In print, referencing-text might invite the same opportunity in the form of "if you look out . . ." or "this is an image of . . ." or "look at X now." But a referencing-image on hover is meant to encourage the click without a word.

Chou's design highlights the work of Ming-Kang Lee, a Taiwanese designer (shown in chapter 4). Chou uses an explicit-trail group that he's attached to the name of the designer in the form of that color change that appears on hover, which is shown in the second screenshot of figure 5.7. On hover acts as both referencing-image through the color change and repetition-proxy because the link is the name of the designer. After engaging with this interaction, the first screen changes to the second, as an explicit-trail emerges. It is a change from white to salmon (darker gray in this book). Its bridge, the referencing-image, leads us to new information on click. On click the screen changes to reveal specifics about the designer. Now that we are in the experience, we need to come back out. A second explicit-trail takes over that also acts as a referencing-image. It is the circle surrounding an arrow that signals users to go back up a level. New opportunities for referencing-images have multiple possibilities in electronic media. In this example, the subtle change in color offers the potential for sequenced interaction.

In sequenced-play, Grouping and Bridging Ties should encourage invitations to look out at specific moments. Sequenced-play assumes that the argument, narrative, or description cannot be sufficiently understood by looking or reading. Looking then reading must be more orchestrated. While this example was a sequence that the designer controlled, what about when the stakeholder has their own agenda?

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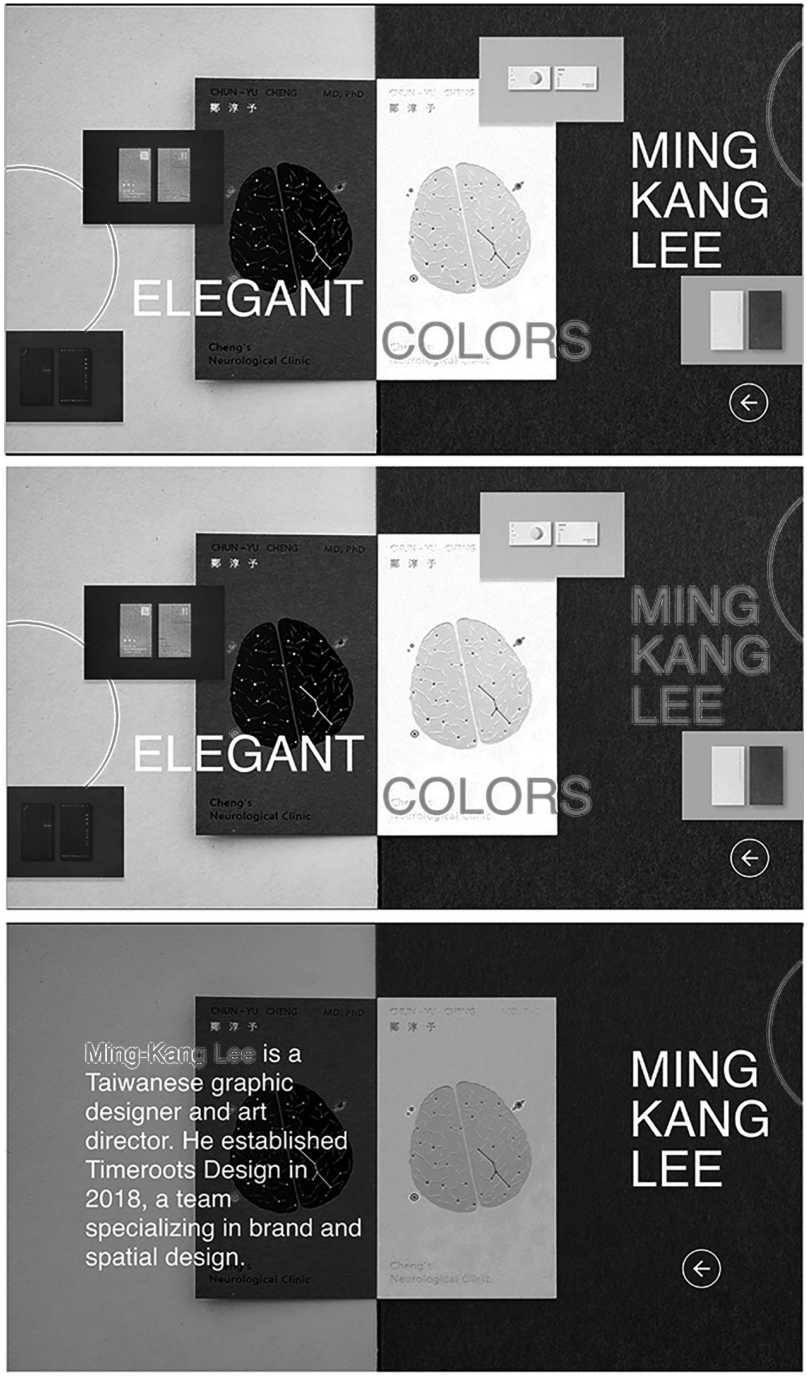


**Figure 5.7**

The Colors of Designers (Designer: Brian Chou). © 2020. Reprinted with permission. The layout incorporates elegant design: Business cards (Designer: Ming Kang Lee). © 2018. Reprinted with permission.

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### Sequenced-Play When the Audience Drives the Sequence

Individuals sometimes have specific tasks in mind. Stakeholder-driven sequences are common in travel guides that answer questions like what can I see today; why will this be fun, interesting, or educational? How do I get from where I am to where it is? While printed guides are no longer used as they once had been, one of the best examples of task-driven sequence is still Richard Saul Wurman's *Access Guides*. These guides provide concise answers to what, why, and how. In his representation of the Tokyo subway, Wurman uses a ying/yang symbol to stand in as a simplified map of the route. The outside edge in green shows a perfect circle, where the train travels around the city. As all maps of its type do, the reality of the train gives way to a simplified shape that is easier to quickly interpret. The curving line that bisects the circle is in red, showing how the train goes through the middle of the city as well as around it. The inside of the circumference names the stops, while the outside names the attractions that a visitor might want to see. Referencing-text, explicit-trails, and repetition-proxy invite individuals to see how the subway is set up, where they will be if they get on or off at a stop, and what they will see at each stop. The map doesn't direct a sequence of looking. Instead, it allows the audience to choose their own task after orienting themselves to the place where they might currently be. The audience drives the order of looking and reading rather than the designer/author. These days, search features linked to databases replace the delight of a Wurman-created design. Be that as it may, these sequences—whether author or audience-driven—are not the tightest type of Inter-play when images are involved. That is inter-weaving.

### Inter-weaving = Juxtaposed-Location or Layered-Location, Contour-Shape or Relay-Shape Groups + Coupling-Pairs, Intersecting-Pairs, or Repetition-Proxy, or Referencing-Text with Possible External-Implied Bridges

Inter-weaving is a tight relationship between words and images that offers an opportunity to deliver a big picture message, captured quickly; one in which text influences what we notice and interpret in the image while the image affects the default meaning of the text (figure 5.8). Loesch's "Geschichte als Argument" (History as Argument), analyzed in chapter 2 is one example. Unlike all the other types of Inter-play, inter-weaving has a

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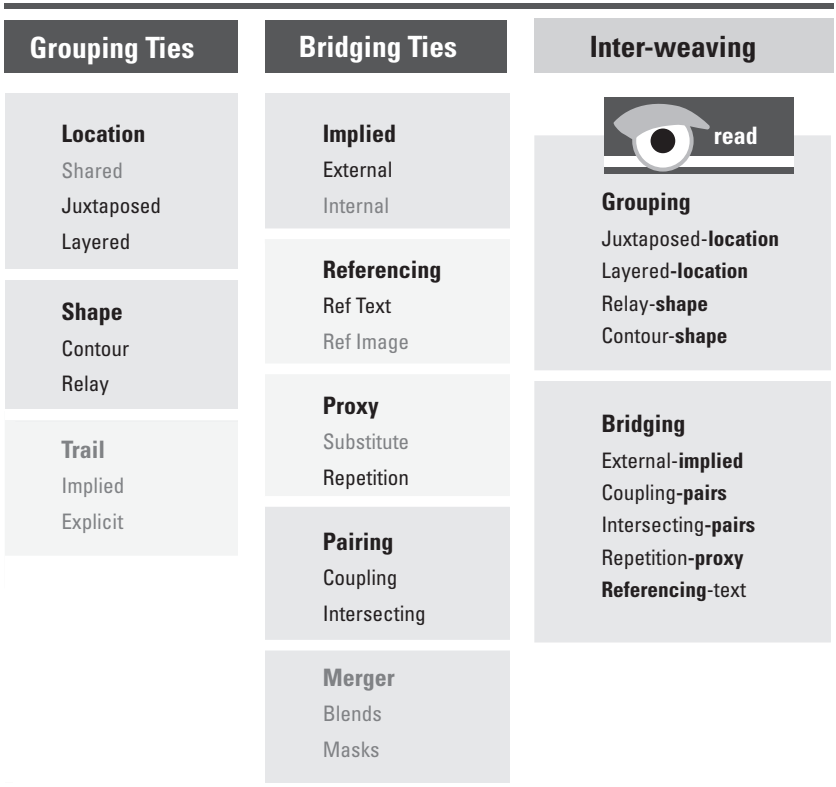


**Figure 5.8**
Inter-weaving (S. Hagan). © 2021.

more limited amount of information—both visual and textual. The point is often captured as a one-page or one-screen affair.

In this type of Inter-play, Grouping and Bridging Ties tap into the slippery nature of words, which allows images to alter their meaning while the text narrows the image's many interpretations. Spent (figure 5.9) illustrates this process through the interaction of juxtaposed-location groups and coupling-pair bridges. Spent also adds a secondary but critical Bridging Tie, the repetition-proxy. Consider Spent's homepage where a common cliché, "it's just stuff" pairs with items that the cliché suggests shouldn't matter.

"It's just stuff" is a saying we toss around until it means next to nothing. But here (figure 5.9), the word "stuff" forms a repetition-proxy bridge to each illustration surrounding the text. Just stuff is now food, it's light, it's

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**Figure 5.9**
SPENT and NamesForChange.Org (Created by McKinney for Urban Ministries of Durham). © 2021. Reprinted with permission.

love and security. The images of stuff reveal that the audience might lack experience with that world or feel some level of bias. Each item shown is a necessity that we want to give to our children. There is the lightbulb, a baby's bottle, a cereal bowl, and a teddy bear. All of them seem to be out of a children's storybook enhancing the feel of safety and the expectation of security. But the next line of text clarifies the contradiction, completing the visual/verbal thought, "until you don't have it." On its own, the text reminds us of our own thoughtlessness. But McKinney puts image and text together to invite extended engagement and reflection using specific items to trigger larger needs. The key lies in the external-implied bridges in the illustrations. While the background of the screen is dark black, which often echoes a sense of depression, here it is also a frame for the images as well as the carrier of an overall mood. The storybook illustrations are comforting rather than damning. The bright colors create a safe place for reflection that the designers turn into an opportunity for action by inviting us to click on either "Continue to SPENT" or the colorful "use your name for good at namesforchange.org." SPENT and NamesForChange.Org turn a difficult realization into a call to action that is accessible. Whether an audience will act by handing over a credit card number is a more difficult area

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for speculation. Still, we must explore many possibilities for action. The interaction on this site issues a strong invitation.

As a last example of inter-weaving, I sheepishly ask you to (see figure 4.8) all the way back on page 119. It is the design *Your Move* from chapter 4. That simple game of tic tac toe with the words outside of the last open box, creates a relationship between two interesting ties of inter-weaving. Contour-shape Grouping Ties creating the noticing part of the relationship. That tie is critical if we are to appreciate the combination of repetition-proxy with referencing-text bridges. The contour-shape Grouping Tie occurs because the open space of the last box in the game has a similar shape to the outside edge of "Your Move." The similarity between "Your Move" next to that open space invites a repetition-proxy bridge where the statement's similar shape to the blank space invites a future proxy that will repeat either the choice earth, O, or bomb, X that the viewer needs to contemplate. It's almost as if the two choices are strobing in the space suggested by the text. Visual closure also occurs between the blank space and the images of earth and bomb. But closure cannot predict the high stakes that the repetition-proxy between the image area and text invites. While the text, "Your Move" with the blank space is proxy for the designed choice between X or O, the most important feature of this poster becomes the blank space for interaction. By allowing the audience to reflect on outcomes and make a choice, a stronger referencing tie bridges between the words "your move" and the blank space, than between the blank space and the images that are already in place, further encouraging reflection on the options and outcomes.

## Multipaneled Cartoons: The Interaction of Inter-weaving and Sequenced-Play

Cartoons deserve and have been the topic of books in their own right.[4] And while their outcomes are not the focus of this book, the general framework of this book still applies. Those image/text experiences employ ties to hold image and text together both through groups and bridges. Multipaneled cartoons offer a hybrid of inter-weaving within the panel and sequenced-play across panels. *Calvin and Hobbes*, like other cartoons, creates boxes around the cells that are explicit-trail Grouping Ties that bridge as referencing-images from one cell to the next. The speech bubbles are also explicit-trails

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that invite referencing-image bridges to connect the text to either Calvin or his tiger-philosopher. Cartoons are not parallel-play, because we must link specific text to a specific speaker at a specific time. In other words, the ties move us back and forth from image to text. Each box invites the audience to follow the sequence, reinforcing the speaker with their speech. One example of inter-weaving within a pane shows that Calvin has built a desk out of cardboard that suggests a business. He sells a product he believes many people need. The handwritten sign, "a swift kick in the butt $1.00," is the text that overlaps the image of the desk with Calvin behind it, creating a layered location tie. It invites the bridging tie, coupling pairs between text and image to join an unusual service to the trappings of a "formal" business.[5] Certainly, a single paragraph does not do justice to the genre. The scope of this book makes that impossible, but the work done by designers and artists in this area make the paragraph necessary.

## Summary

The examples in this chapter represent the four loose to tight unions. They are symbol-bond, the tightest type, limited to text and typeface; parallel-play, the loosest type, paired with images that invite the audience to look or read at their own time and pace; sequenced-play, a series of ties that invite the reader to become the viewer at particular moments; and inter-weaving, another tight type of Inter-play that most often presents big picture ideas.[6] I argue that Inter-play should primarily be studied not from a genre perspective but as an opportunity to explore how communication and interaction design can either challenge inexperience and bias or feed it. To that end, the next chapter looks more closely at complementary meaning—meaning that would change if the image, text, or typeface was altered or removed; meaning that encourages us to form new references and associations based on probative image/text/typeface interactions that clarify, contradict, or challenge.

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# 6 Complementary Meaning: Clarifying, Contradicting, and Challenging

> The differences make the biggest difference when images alter the default meaning of text while text narrows the interpretation of images.

The principle of relative certainty (chapter 1) informs decisions concerning what combination of image, text, and typeface to use within unions created by Grouping and Bridging Ties. Within those four loose to tight unions, the non-probative outcomes, summarized in the introduction, are non sequitur, decorative, feely, truthy, and fantasy. The probative outcomes, reinforcing and complementary meaning, occur when the image/text/typeface relationship provides a claim/reason or proof connection with enough information to decide that the claim is more likely true than not.

There is an important distinction between the claim/reason/proof outcomes of reinforcing or complementary meaning versus those that are "truthy," which only ease processing. As discussed in the introduction, Zhang et al. (2021) found that image/text communication offers truthiness when the result merely "seems" true. An image of a turtle beside the text, "Turtles are deaf" (p. 2) does not offer evidence of the claim. But if a color photograph of a turtle was next to text that stated, "The turtle's flippers have black and white patterns," a viewer could examine the image to decide if the claim is more likely true than not, taking it out of the truthy category and placing it into reinforcing Inter-play or complementary meaning that clarifies depending on that viewer's prior knowledge.

### Bias and Inexperience

While each of the seven non-probative and probative outcomes deserves a chapter of its own, I focus on complementary meaning because it has

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the most potential to do good work in the world, and it is the one that we least understand. With that in mind, this chapter considers examples that address problems of inexperience or bias for an audience who would not, could not, or did not think to imagine along hoped-for lines before being confronted by the design. When a group lacks knowledge, they cannot imagine along hoped-for lines. When they hold a bias, they will not want to imagine in any way other than what they have been doing. Anything else would involve holding two contradictory perspectives at the same time. Cognitive dissonance theory suggests we cannot do that (Brehm, 2007). One way to address dissonance involves giving the new idea more weight. In the face of bias, Inter-play needs evidence to add that weight. Consider the tiger from the introduction (figure I.3). The live tiger with the text "I am not a rug" shows what it tells. But "I am important," is a claim without proof that does not remove weight from the idea that tigers are at their best when they are lying flat by the fireplace.

Complementary meaning has an uphill climb in the face of strong bias or intractable assumptions (see chapter 7 for thoughts on this), but it has a better chance when we identify where an audience will imagine problematically. Designers use that knowledge to make choices concerning direct (image) and indirect (text) experience in the design. In that informed approach, the direct experience of images with the indirect experience of text offer claim and reason or proof that bias would not have imagined, and inexperience could not have dreamed of. Complementary meaning won't solve the problems of this world, but it's clear that we need more serious tools like this to at least give it a go.

This chapter employs only one union. As noted in chapter 5, symbol-play, parallel-play, sequenced-play, and inter-weaving determine the structure of the piece, but none of these loose to tight unions *dictate* that complementary meaning will be found within them. This chapter singles out examples of inter-weaving unions to prove that a particular union can create all three subsets—clarifying, contradicting, and challenging. A single union can build meaning from the raw materials to clarify a new idea, challenge existing perspectives, or show the irony in a world turned upside down. In each, useful reasons or evidence within the boundaries of the medium depend on unions to effectively join direct and indirect experience synergistically.

When complementary meaning clarifies, it fills a knowledge gap that benefits from the collaboration of direct image experience and indirect

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textual experience. Using the principle of relative certainty, image meaning with textual meaning fills in imagination's gaps. Learning how to use your tire jack if you've never taken it out of the car is more likely when you don't have to guess where the "saddle" is and what it does. Flat tires are one thing. In a more complex arena, O'Halloran (2004) found that when visual dynamics were applied to mathematics, they altered and enriched the problems that mathematicians could consider. Clarifying complementary meaning enriches understanding. But in situations where the world feels upside down, or when problematic assumptions would benefit from further reflection and change, challenges and contradictions address it.

When complementary meaning contradicts, it describes situations where the world currently feels "upside down" but might change back to an earlier or better state once a vexing problem is solved. In the experience of contradiction, what we see opposes what we read. A picture of a sad face with the caption, "I am happy" is one example. A more complex offering appeared in 1940 when Paul Rand created a cover for *Direction Magazine*. This now well-known design appeared during the holidays right after the United States had joined WWII. While that sudden change in the world was temporary, it was drastic and cruel. At first glance, Rand's famous cover for the magazine's December edition looked like a version of a wrapped present. On it was a handwritten tag that said Merry Christmas. The words "Merry Christmas" on a package can recall a Norman Rockwell picture of happy family holidays with gifts and carols. The handwritten text reinforced that view. However, the ribbon on the package was made of barbed wire, creating a contradiction between Merry Christmas and the reality of that particular season. Christmas was not merry that year but could be again. It was a horrible, but temporary upheaval, one that Americans needed to understand and accept. While that actual package would never exist, one could look at its parts and determine that the claim was true. Christmas would come with its trappings, but it would be a bitter pill, frightening and sometimes devastating because the "gifts" that year were unwanted.

Complementary meaning that contradicts invites us to see the world stripped of its veneer so that we can look at what is real in the moment—the current state that gets in the way of hoped-for experience. In Rand's magazine cover, the raw materials are tightly overlapped so that the whole can communicate a cheerless irony manifested in a presentation of contradictory experiences. How could anyone be "merry" when so many men

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and women would not enjoy the simple pleasures of extended family gatherings—and in fact might never enjoy those pleasures again. The claim that Christmas is merry could not to be taken seriously in that environment. The ties allowed words to stand in opposition to the spatial relationships in the image, while the image stood in opposition to the ordinary meaning of the text. Rand's work encouraged a place for reflection, staying with the reality of the moment and reporting on how different that moment was from the usual reality.

But in situations where ongoing bias or problematic assumptions inform audience thinking, challenges can provide direct with indirect experience to show as well as tell an opposing idea that an audience would not imagine. The hoped-for result is a change in behavior, improved critical thinking, or a more enlightened set of assumptions. Changing minds is made more difficult not only because of cognitive dissonance but also selective exposure. While cognitive dissonance requires that the new idea gain more weight to be accepted (Harmon-Jones, 1999), selective exposure is the tendency to seek out what aligns with our beliefs (Wilson & Walsh, 1996), making it more difficult for new ideas to gain traction.

Whether Loesch's *Geschichte als Argument* (figure 2.1) challenged or clarified would depend on audience assumptions. In considering the meaning of this design, we should remember that Queiroz and Merrell (2006) emphasize that any moment tied to creating meaning is never truly stable. Interpreters are impacted by new experiences where time is a factor. If experience has taught you that history is truths uncovered, Loesch's work would provide a challenging perspective. If your experience suggests that recording history is a race against its destroyers, Loesch would offer a clever clarification. To be only a reinforcing example, a smaller set of stakeholders would need to imagine Stasi in the act of shredding.

The outcome of Inter-play will not be effective unless it responds to an audience's existing assumptions, biases, and knowledge. We can't ignore those realities. Consider the abaya, a long, elegant robe worn by Muslim women often with a hijab covering the hair, worn to signal modesty. Depending on the audience, their histories, geography, culture, and disposition, inferences attached to the abaya and hijab will change. The clothing will signal that you are different from me or like me. It will make the wearer look safer, kinder, or more dangerous depending on an existing point of

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view. When an image of a woman in an abaya and hijab ties to text that puts the wearer in a positive light where the image and text act as claim and proof, the result could clarify meaning for those who have good or neutral feelings toward the clothing and the women who wear it. It could also challenge an existing point of view.

The need to consider existing assumptions before selecting content elements affects decisions about image, text, or typeface. Each element must make an important contribution to the message that is not repeated by the others so that it accurately reflects audience need for direct (image) versus indirect (text) experience. The two should make one synthesized message. Meaning should change if one of those elements were altered or removed.

This interaction can affect the denotative or connotative meaning of words. Cat is "a small domesticated carnivore." But the second definition is "any of several carnivores of the family Felidae." Further down, a person can be a "cat" (dictionary.com., n.d.). The definitions are different but correct. The word "cat" brings an imagined animal to mind—until it doesn't—influenced by your history and interests. Inter-play quickly narrows the intended denotation.

Connotations similarly fluctuate depending on the audience. When Hitler referred to Jews as mice, it was to insult them, using that metaphor to attach the label less-than-human onto truly human lives. But when Art Spiegelman later drew Jews as mice in *Maus* (1986)[1] he challenged that connotation by pairing it with events that showed the flaw in the insult. The degradation remained but was altered to victimization and challenged by the creative solutions developed by those victims. Spiegelman did this through contradiction, showing both visually and textually over the course of the book, how the world had turned upside down, no longer matching the world as we expect, or at least hope, it will be. In *Maus*, the experiences of Jews in WWII turned the tables on the symbols of their degradation, illustrating the insult and the fear, but also the humanity.

Associative ideas[2] are individually held and affect audience interaction with visual/verbal forms. For some, the word Paris will conjure up a scenic description of a street-level view of the Latin Quarter, while another sees her balcony in the Fifth arrondissement. In many situations, this will not matter. But when it does, meaning at the intersection of image and text can put an audience on the same page. In the examples that follow,

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complementary meaning that clarifies, contradicts, and challenges is represented through inter-weaving. Employing only inter-weaving shows that a union has multiple outcomes.

### Complementary Meaning that Clarifies

Complementary meaning that clarifies has the effect of opening a world for the audience without challenging basic worldviews. Its statements, questions, and demands linked to spatial relationships enhance our understanding of people, places, and processes. The first example (figure 6.1) takes on a lighter topic—energy and excitement in a museum that should not get too out of hand.

*Bang on a Can*, created for the Walker Art Center, employs the Grouping Ties layered-location in its overlaps between text and image, and relay-shape in the way that image and text complete a shape that supports the text. The Bridging Ties are coupling-pairs. The typeface and text, as always, come together with a combination of shared-location and merger-blends. In exploring the Grouping Ties, layered-location appears as white and gray rectangles layering one on top of the other with the text BANG ON A CAN as the top layer.

With Grouping Ties encouraging notice, Bridging Ties encourage the idea, through coupling-pairs, that text and image have energy. It shows up as movement in the altered baseline and letterspacing of the headline "BANG ON A CAN" that couple with the moving shapes underneath. By adding skillful shared-location and merger-blends between text and typeface, the design encourages us to interpret that altered baseline, not as incompetent typesetting, but as inventive drumming. The interpretation is reinforced in the coupling-pair between the "N" that looks like it is banging on the can below it. The energy suggests movement because the large gray rectangle has moved far away from its nested place inside the line of body copy, a contour-shape that should "surround" it. These ties lead to two conclusions. First, the Grouping and Bridging Ties are an example of inter-weaving. Second, the Bridging Ties suggest a relationship between text as sound (BANG), and image as movement that have a controlled quality and loud volume. This example shows that claim/reason/proof relationships can emerge from simplified images that benefit from the authority of the speaker, the Walker Art Center. We might not see the actual people or

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Walker Art Center
and the Minnesota Composers Forum
present
Direct from New York's acclaimed Bang on a Can Festival, an annual celebration of explosive avant-garde composition, comes this three-hour concert by the festival's star performers.
The lineup includes some of the country's most accomplished musical blowers, pounders, pluckers, pullers, sliders, scrapers, and grunters—not to mention strikers of such objects as car parts, pots, and bones.
BANG
( BANG )
on
A CAN
ALL-STARS
mini music marathon
Maya Beiser
Robert Black
David Lang
Lisa Moore
Steve Schick
Mark Stewart and
Evan Ziporyn ...
... will offer pieces by nationally known composers, including premieres of works by Louis Andriessen, Michael Gordon, and Eleanor Hovda, as well as compositions by David Lang and Frederic Rzewski.
" an irreverent boundary smashing event ... an array of avant-garde musical styles and a lively burst of contemporary fireworks. "
— New York Times
8 pm
$ 10 ($8)
Saturday, November 21, 1992
Walker Auditorium
For tickets, call the Walker box office at
375-7622.
($) = price for Walker and MCF members, seniors, AFDC cardholders, groups of 10 or more

**Figure 6.1**
Poster: Bang on a Can All-Stars (Walker Art Center). © 1992. Reprinted with permission.

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drums, but this is a real event as proven by the place, date, and time. Even though simplified, the illustration makes it clear that these drums are made of metal. If you beat on them, they will make some noise. It does not need to be stated. Someone considering attending the event should not be surprised that it will be loud so that they can decide, based on this evidence, if that is their cup of tea.

*Bang on a Can* accomplishes the objective of clarifying sound through sight. Unlike Cowgirl (figure 3.5), which destroys Bridging Ties to turn words into rhythm, *Bang on a Can* simulates experience without damaging the Bridging Ties, the coupling-pair, or the merger-blend. Every letterform is complete. Heller and Pomeroy (1997) note that typographic visualizations can echo the sound and/or emotion of the text. *Bang on a Can*, even with its fully intact text, does so. There is a bit of genius in the move to be loud without damage. A closer look reveals why.

These large letterforms sit on an altered baseline, newly positioned up or down because the "vibrations" have moved them out of their more uniform spacing. The experience of ongoing vibration comes out in the bouncing suggested by the outlined letterforms that rise and fall vertically. The letterspacing within the words (kerning) also expresses the effects of the cans' intense rhythm. Letters are sometimes too close to each other, and sometimes too far apart—especially the "G" in the word "BANG." The banging is so extreme that the letter "G" separates from the rest of "BAN." Two other elements also emphasize this experience. One is in the simplified image of the 50-gallon can and the drumsticks that play it, emphasizing the sound's location and quality. The inclusion of the can helps to amplify and narrow the quality of the sound we see. It is atypical, performed on a "found" instrument, placing emphasis on the means of expression. Even so, the limited information suggests this sound's quality might remain somewhat mysterious. Not being able to fully imagine this sound plays a role because one must attend the concert to have the full experience.

But as for that bit of museum-related genius, compare *Bang on a Can* to Paula Scher's posters for the Public Theater. Her posters emphasize a radical free-flowing spirit, placing text every which way to fill each crevice at every angle, which adds to that intended spirit, one of packed intensity that fills every inch of the space. In comparison to Scher's Public Theater poster, *Bang on a Can*, while communicating energy and creativity, suggests a different environment through the white space that opens areas of sound

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to moments and places of rest. Scher filled up the space within her Public Theater posters, giving them a stronger sense of a free-for-all spirit. "Do what you want!" *Bang on a Can* clarifies an experience that is filled with energy, while not packed and crowded. It is a combination of overlaps but also of order. *Bang on a Can* is, after all, in a museum, making it important to notice the elegant white space *shapes* that rein the chaos in. The white space shapes both above and below the words *Bang on a Can* form rectangle-like areas of constraint that suggest that order would surround the artists who performed for an audience who will likely sit and listen, and applaud, rather than fully engage with rhythms until they get out of hand. Both approaches signal expectations for the attendees. *Bang on a Can* prioritizes the nature of sound rather than its human source or the actions of any humans in the space. In the Walker Art Center, the All-Stars are left to the imagination. Their names are available, but not their personalities. Compare that to the Public Theater posters that don't just bring on the noise, they show you on whose shoulders that noise will be brought.

Within the Walker Art Center's inventional world, consider the words alone and the meaning they contribute.

**Bang on a Can All-Stars**

Steven Heller (1996) argued that the mid-1950s, "The Age of the Big Idea," were the glory days of creative team design. As teams of writers and designers, they never forgot that they were working in a medium in which visual and verbal elements can impact each other. In *Bang on a Can*, the verbal is as carefully developed as the visual. Part of this is the serendipity of the group's name. While the All-Stars are technically drummers, the phrase "Drum on a Can" would have lowered the volume, leaving out the raw energy that begins to emerge with Bang. The prepositional complement, "Can" modifies the verb "Bang," suggesting both sound and object. But these words alone cannot communicate enough energy or volume.

Divorced from the text, the images that re-present meaning in *Bang on a Can All-Stars* do an amazing job of suggesting how sound creates vibration. *Bang on a Can* does not just use white space to create an aura of museum expectations, it employs that *negative space* to echo the movement of the grey rectangle. If you trace the shape of the negative space formed inside the smaller text that includes, "this three-hour concert . . . ," a right angle forms (under the gray shapes), and another rectangle emerges. Its angle

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relays with the gray that is on top of it at an opposing angle. The grey shape behind the word BANG seems to have moved from its "original place" in part because the negative space shape formed by the text tells us so. *Bang on a Can* again emphasizes its unique qualities by expanding the effect of sound on non-object as well as object areas.

The bold typeface echoes the physicality of a loud sound, while the quality of that sound is approximated using letterforms that have both serif and sans serif aspects adding to the controlled chaos of the situation. These letters are rougher versions of classic Egyptian faces with their thick slab serifs. The serifs also can conveniently act as sticks for drumming. The layered-location Grouping Tie together with the coupling-pairs Bridging Tie not only create a tight interaction, noticing invites us to interpret unpolished letterforms as making sound when they hit an unconventional instrument. The word All-Stars, which stands in for the people, is embodied by a typeface that is smaller and sits off to the right, stacked and diminished. The sound matters more. It clarifies the nature of banging, gives off a sense of energy, and sets up expectations concerning the boundaries of this simulated experience. The next example of complementary meaning that contradicts takes on a different kind of energy, one with more toxic results.

### Complementary Meaning that Contradicts

As noted earlier, complementary meaning that contradicts produces ironic outcomes when text or image alone would communicate a relatively straightforward message. Placed next to the other element, the two become a relationship of opposites. Tied together, the collaboration suggests the absurd, the tragic, the world turned upside down whether it is an individual world or one shared by an entire community.

In 2013, a student in Belgium took it upon himself to develop a campaign about violence against women as part of a class exercise (figure 6.2). He enlisted his friends as models and makeup artists (Petitdemange, 2014). His campaign had such a strong impact that it went on to be included in Women's Rights are Human Rights: International Posters on Gender-based Inequality, Violence and Discrimination, curated by Elizabeth Resnick, Professor Emerita, Graphic Design, Massachusetts College of Art and Design. As Resnick (2016) states, its purpose was:

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> to celebrate and acknowledge the vital role that all citizens should play in protecting and promoting human rights while actively challenging gender inequality and stereotypes, advancing sexual and reproductive rights, and protecting women and girls against brutality. In their collective visual voice, these posters promote women's empowerment and participation in society. (Resnick, 2016)

Through these posters, photographers, models, and makeup artists had done what Resnick asked before she asked it, playing their role in promoting human rights.

At times, irony can lessen impact. Everything can be ironic. But in this particular situation, tragic ways of thinking stand out for notice. Given that makeup artists were involved, one might question if this design offers evidence, but our prior knowledge sets up the truth of the premise that battered women are in our midst and often hidden. Further, the poster's text reinforces the point. A specific number of women are dying. The design accomplishes two goals. It brings the problem out of hiding so that those not directly affected cannot avoid it. A more important goal is the opportunity to speak to those women who are being hurt, to bring out for them the confusion of their own situations so that they might seek help. They can see and read that they are not alone. Hiding and shame is such a large part of the problem that the young women in the photographs, models who would normally want to look good, were willing to look battered and abused. They encourage larger communities of women to find a way out by seeing the contradiction in their own tragedies. Of course, one series is not sufficient to end abuse, but it is another step. And of course, this tragedy isn't limited to one gender.

We need series after series to show the problem in full not only because the tragedy and incongruity of love linked to abuse continues, but also because measures to improve lives must continue to evolve. In 2019, the *New York Times* announced that France had put new measures against domestic violence into place. On the one hand, this marks awareness. But on the other hand, advocacy groups argued that the plan was underfunded (Breeden, 2019). Breeden reported that "a woman is killed in France by a partner or former partner every three days, one of the highest rates in Western Europe."

In 2021 in *Foreign Policy*, Beatley argued that France's culture of seduction sets a dangerous stage, noting that in 2019, domestic partners killed 146 women. It would seem as if nothing can stop this rage. But design has

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**Figure 6.2**
AÏE LOVE YOU (Artist: Gillon Nicolas for Violence Conjugale Appelez Le 3919). © 2013. Reprinted with permission.

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contributed to change before. *Business Insider* reports on seventeen poster campaigns that had significant impact (Baer, De Luce, & Feloni, 2019). The *We Can Do It* poster that introduced Rosie the Riveter in 1942 also inspired women in the 1970s and 1980s. In 1983, Friends Don't Let Friends Drive Drunk helped to alter what the norms were, including having a beer while on the road. Change can feel frustratingly slow, but design must do its part.

In the public service poster "AÏE LOVE YOU," the photograph of a woman who is beaten and bruised stands in contrast to the words LOVE YOU. The photographer Gillon Nicolas intended this work for a French speaking audience and with that in mind, French/English wordplay adds to the meaning in the word AÏE, which sounds like "I" but translates to English as OW!, the feeling of sudden pain.

In creating that effect, this poster employs layered-location and coupling-pairs with shared-location and merger-blends in the typeface/text relationship, proving that ties do not determine outcomes. These same ties gave *Bang on a Can* its energy. Just as the that poster used overlaps, the words "AÏE LOVE YOU" physically overlap the woman in the photograph. The shared-location and merger-blend of the text and typeface result in a message that is so large and condensed that it is just as important as she is, which is part of the coupling intention, to give the meaning of text and image equal weight. To an American speaker, the text seems to include a repetition-proxy bridge between the first word that sounds like the first person "I" and the woman. But the word is really a reaction, or the echo of an earlier reaction from many women. That this is more than word-*play* makes the situation of the abused woman more awful. The text negates her, substituting pain for person. OW! replaces the agency of the first person with a reaction to the violence she endures. It is the exact opposite of what we saw in the introduction with "I am not a rug" (figure I.3). What should be repetition-proxy becomes an external bridge to an experience of pain that should not define love.

The layered-location Grouping Tie binds the image with text, allowing the coupling-pair Bridging Tie to make this expression of love physically damaging. AÏE's sound reverberates. What makes matters worse is that the effect of abuse is clear. The woman's eyes are blackened and her nose bloodied. Gillon's use of models, whose battering has been created with makeup, means that the external-implied Bridging Tie as well as the smaller text "la mort 121 femmes en France" play an important role. Gillon counts on prior

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knowledge to confer authenticity to a shocking representation of a woman standing in for actual experience that has been documented in police photographs. That she looks directly at the camera suggests a level of agency that the bruises argue against. But these models also connect with real victims, looking at them in a kind of sisterhood. Defiance as well as defeat lie in the realm of possibility. The combination of hurt (OW!) and strong feeling (LOVE YOU) continue the contradiction signaled by loving what is harmful and painful. Her world is upside down. Her face emerges out of darkness. So much about this image screams "get out." It is a contradiction that doesn't need to be permanent, but it seems that the AÏE will have to change to I before the LOVE YOU can fade. As if to reinforce the seeming futility of a situation that does not need to be futile, the overlapping text on the right, much smaller than the woman or the text to her left, explains that in 2013, 121 women died in France because of relationship violence. Appelez Le 3919 reminds women in this situation that there is a number to call. Even if love does not fade, the consequences of violent love can be mitigated. The colors and symbols of the Republic of France lend authority to the promise of help. The hope is that a woman in that situation will not only see herself but also will realize that love linked to pain does not have to be permanent.

### Complementary Meaning that Challenges

Uwe Loesch designed „Little boy " – in 1995 for Le Mouvement de la Paix to commemorate the fiftieth anniversary of the destruction of Hiroshima (figure 6.3). "Little boy" was the name of the bomb, at one time a name everyone remembered. While irony exists when a nuclear device merges with a name that begins with a diminutive, the real power of this design lies in the challenge it posed between the little boy it re-presents versus the one that text asks us to imagine.

„Little boy " – 's Grouping Ties are layered-location between text and image and shared-location between text and its condensed grotesque typeface. Its Bridging Ties include an invitation to interpret the intersecting-pairs between the photograph of a child who has more presence in the space than the words and typeface. Intersecting-pairs differ from coupling-pairs in that decision to make one part more important than the other. While the child has more presence here, children had no agency when

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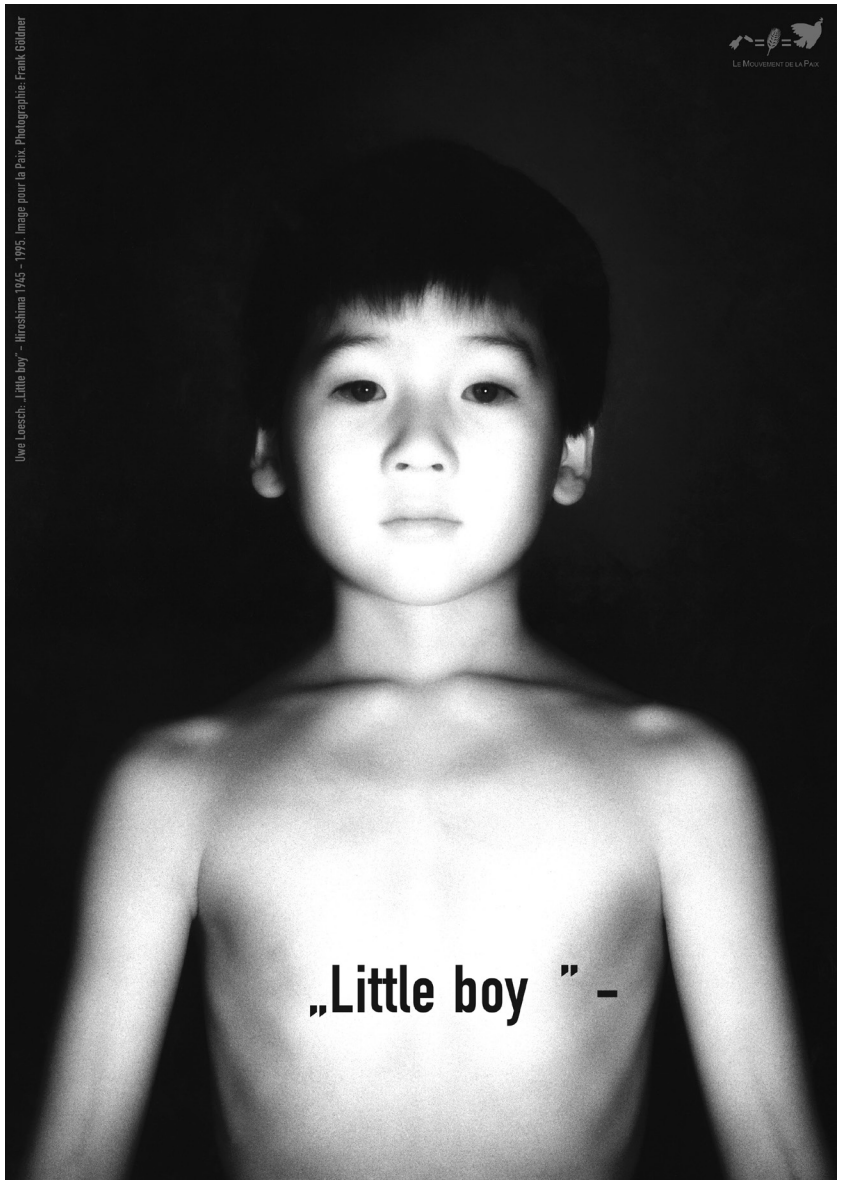
Uwe Loesch...Little boy" – Hiroshima 1945 – 1995. Image pour la Paix. Photographie: Frank Gildner
Le Mouvement de la Paix
„Little boy " –

**Figure 6.3**
Poster: „Little boy " – (Designer: Uwe Loesch). © 1995. Reprinted with permission.

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the other little boy dropped out of the sky. The merger-blend between the words with a smaller condensed sans serif typeface positioned lower in the frame and with subtle spacing issues (e.g., the L and lowercase i don't have the same visual letterspacing as the other letters in the word) reflect a machine that is as imperfect as this bomb certainly was (even for those who argue it saved lives). The intersecting-pair and the substitution-proxy between the image of the little boy and his textual stand-in do the heavy lifting to ultimately challenge the audience. Part of that challenge emerges from the bright white effect that lights the actual little boy using infrared film (Mayer, 2010). The effect suggests the moment when the blast lights up everything around it. Contemplating that moment, makes it even more difficult to fathom. Because of the film Loesch used, the boy is there, but at the same time, it's almost as if he is not. He shimmers in unnatural ways. The horror implied by that moment between life and death arises because the boy and language have an external-implied bridging tie to the event this poster represents, supporting its truth value.

The intensity of the little boy who is both repeated through the name but separate from „Little boy " – invites us to grapple with ideas such as the implicit bias present when contemplating whose life matters. The concept of implicit bias lived within this poster before the term became common in the lexicon (Greenwald & Banaji, 1995), challenging perspectives on who is "the enemy," and who represents the good. This substitution-proxy, one little boy for the other, is the substitution of one concept—the value of a child, a civilian who might not look like the United States "us" of the 1940s—for another, the value of victory and the soldiers who do look like "us." One might hold the belief that without the bomb more lives would have been lost. But that belief must still contend with the reality of this child. To reflect on innocence in the face of destruction is something that Loesch makes possible by substituting a person for the place where this happened. Loesch describes the effect of this challenge beginning with the headline. He writes, "[t]he headline „Little boy " – becomes the baseline. It is deliberately placed a little too small in the middle in a subordinate position. This reveals the absurd relationship between the object depicted, its designation and its representation" (U. Loesch, personal communication, February 15, 2021).

The object, the dominant actual boy, intersects with the designation of the subordinate text, a more menacing little boy. By creating this tension

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through that intersecting-pair, Loesch demands a solemn focus on children before the "more important" anniversary that brought this poster into the world. In the typeface, the bomb becomes tentative, the distance from word to its marks of punctuation are a pause that Loesch designs. It is the need to pause, to challenge ourselves to consider what we are doing and to think about the innocents versus a bomb with such an innocuous name. These labels should at least remind us of the horrible cost, which „Little boy " – is incapable of communicating but completely able to forecast.

With minimal information, every element placed in this format must have a reason behind it. As with "Geschichte als Argument" the Grouping Tie that layers image with text helps us notice that the bomb has lesser value than the boy who looms over it. It remains the case even though many of the children who were there that day quickly disappeared—out of sight, out of mind. Bridging between the dash, the pause, and the child, suggests this child, who represents all those children, might now in this moment of pause find their humanity restored through Loesch's challenge to our comfortable lives and unjustified bias.

For Loesch, the challenge to remember atrocities should not be represented by imagery of those atrocities, which could take on a twisted aesthetic. Instead, he notes, "the only way to remember the victims of inhumanity is to make a demonstrative gesture of humanity" (U. Loesch, personal communication, February 15, 2021). In this challenge to remember, Loesch notes that there is an opportunity to meditate on the complex human inconsistencies that came together on that day. That we care about children is made ridiculous by a bomb called "little boy." Even mothers we see as nurturing are called into question. The pilot named the bomber he flew after his own mother, Enola Gay. It is horrible to consider that Enola Gay and "little boy," a mother and a child, would represent the annihilation of an entire city and so many little boys and girls who lived there. The image of this boy stands in for them all, vulnerable but also strong in the way that he looks out into the world. Through the placement of two competing "little boys," we are challenged by the idea that what we think comes into conflict with what we do.

Loesche's minimalism reveals the complexity of the concepts he explores. The lighting on this boy through the film used brings him into stark contrast, but it is the glowing light before the destruction begins. Small moves make meaningful differences. Put the text in the visual center and the

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coupling-pair would make equals of the text and boy. The intersecting-pair means that re-presentation can dominate re-articulation. The placement of the headline well below the visual center does not adhere to optical expectations, but instead informs meaning potential in its diminished position, which aligns with Loesch's "principle of optical disappointment" (U. Loesch, personal communication, February 15, 2021) that makes the big thing, the bomb, small, and the small thing, the boy, overwhelmingly important.

This opportunity to meditate on these little boys resonated then and continues to do so. In addition to its exhibition at Le Mouvement de la Paix, „Little boy " – was awarded the 1996 Grand Prix in the international competition Deutscher Preis für Kommunikationsdesign, which is now the Red Dot award. In 1997, it won the Silver Medal in the International Poster Triennale in Toyama, Japan. It also received the Bronze Medal in the 7th Triennale international de l'affiche politique Mons, Belgium. „Little boy " – is in the collections of MoMA in New York, and the Deutsches Plakat Museum in the Museum Folkwang, Essen. It has found a home in the Museum of Modern Art, Denver, and was exhibited in 1995 for Earth Day at the World Trade Center, New York.

A challenge encourages an audience to rethink their assumptions and biases and consider new ways of thinking. In an effective challenge, image, text, and typeface group and bridge to engage critical thought on thoughtless or toxic assumptions. The use of image, text, and typeface rather than image or text alone helps the audience re-see direct experience as well as re-word the indirect experience of assumptions about race, gender, community values, or professional or scholarly practice. Some problems are more difficult to solve than others because entrenched ways of thinking allow us to get on with our lives too easily (Harmon-Jones, 1999). A challenge asks that we stop and think about the issue and its consequences, with the hope that we will act differently in the future.

Using typography to express how something feels, as Loesch used the pause and the dash, echoes a finding from Mark Turner (1996), who notes that we commonly communicate abstract ideas using textual metaphors, parables, or analogies based on concrete events. Guilt has no physicality and yet we feel the weight of it. With these tools, we must organize experience as best we can through the two systems that Paivio (2007) found are available to us. Turner notes that what we find hard to explain in the

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abstract we more easily understand once it is embodied and given physical qualities. In „Little boy ” – , our historic guilt is re-presented, embodied by someone who has no power except what Loesch gives to him through the placement of those words with that image.

## Summary

Complementary meaning that clarifies, contradicts, or challenges can use many different containers—unions of Inter-play. In these three examples, we see that a single union can become many kinds of complementary meaning. *Bang on a Can* clarifies sound as well as expectations of our place in that environment. AÏE LOVE YOU uses inter-weaving to express the irony of love in pain. In our interaction with „Little boy ” – we are challenged to reflect on the inconsistencies between our beliefs and our actions. Within the poster, Loesch restores the humanity of those made less than human.

When complementary meaning focuses on concrete images, text, and typeface, the results, clarification, contradiction, and challenge represent opportunities for designers and writers to invite audiences to critically think about their own misconceptions and assumptions. However, the field is open to more ways to weave these elements that might offer even more opportunities. The next chapter will explore complementary meaning as an untapped opportunity to not only weave actual, concrete images and text, but to also add imagined images and text into that cloth as a sequenced experience. By imagined elements, I mean scenes and people that text invites us to imagine, and statements, questions, and demands that images invite us to create for ourselves. By inventing and composing a weave of both imagined and concrete elements, I argue that avenues of exploration are open to new ways of using image, text, and typeface that could potentially lead to more effective arguments that challenge inexperience or bias.

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# 7 Exploring "The Can't-or-Won't Conundrum": Weaving the Imagined with the Concrete

> Complementary meaning through sequenced-play opens an avenue to untapped possibilities, allowing later work to determine if the destination is worth the trip.

This chapter explores a problem that sequenced-play might be particularly suited to address. Graphic novels like *Maus* (1986) and the other work included in this chapter suggest it. I want to open this avenue for invention to practice-informed feedback, encouraging accountability to what the data show us later.

When Paul Rand put his handwritten "Merry Christmas" on that barbed wire package and in doing so tied the imagined joy of Christmas to the suffering of war, the effect was dramatic. The idea remains salient because Rand's Western audience could, and still can, imagine what he needed them to "see."

But audience imagination can be a mixed bag. Consider "Eid Mubarak" in place of "Merry Christmas." Eid Mubarak means Blessed Eid. Eid-ul-Adha is the holiday celebrated to remember Ibrahim's willingness to sacrifice his son before being allowed to substitute a sacrificial lamb. The passage is in the Quran and the Old Testament, but while most know the story, Christians, especially in the West, tend to be unfamiliar with Eid. That inexperience and possible bias stand in the way of engaging with the kind of empathy that an homage to Rand's work should bring (figure 7.1).

If Rand had used Eid instead of Christmas, would non-Muslims empathetically imagine this unfamiliar holiday in the context of war? Recent history does not increase confidence. Negative connotations could impact the imagination needed to gain a compassionate view. And yet, that kind of understanding needs to be fostered.

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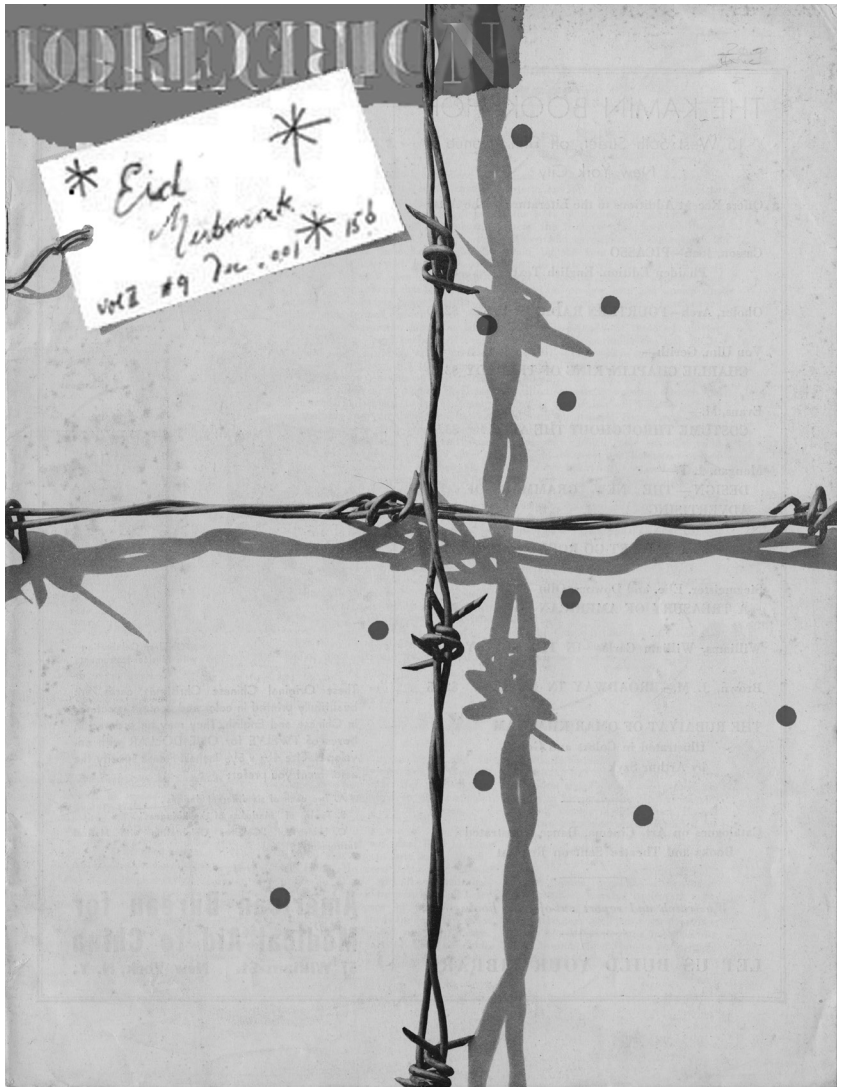


**Figure 7.1**
Cultural Exchange: A reflection on place in an homage to Paul Rand (Design Fiction: S. Hagan). © 2021. Published under fair use.

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Designers and writers face a particularly difficult challenge when an audience steeped in bias or inexperience must try to imagine something that they do not prefer or do not understand. This is the designer's *can't-or-won't conundrum*. Can't-or-won't prevent the audience, an important collaborator and stakeholder, from imagining in ways that could change existing situations to better ones. Writers face this too. Consider the challenge of scenic description where the writer provides clues that help audiences imagine a world within hoped-for boundaries. When they can imagine effectively, they become the author's most trusted collaborators. But in situations with strong can't-or-won't, such as imagining "global warming" in the middle of a polar vortex, collaboration could prove difficult. The offhand comment, "I'd sure like some global warming about now," takes imagination in problematic directions.

The conundrum designers face is the audience's preference for established ideas (Harmon-Jones, 1999; McGregor, Newby-Clark, & Zanna, 2009), which undermines their ability or willingness to imagine something new. I argue that inviting can't-or-won't into the designed space could help to overcome these stuck points. As a practical matter, this means designing biased imagination into the experience rather than pushing it away. Three examples consider this process, but before going there, why might it be useful to invite and amplify what we wish to diminish?

## Inviting Imagination

Mind's eye images are colored by our histories and interests (Solso, 2003). Recall that our shared histories mean that the hurricane we imagine with a female name, will not be as vicious as the one with the male name (Jung, et al. 2014). It is not only what we imagine that varies but also its quality. Loomis, Klatzky, and Giudice (2013) suggested that the images we see in our mind's eye are different from what we see when actually looking. Since that time, new research suggests a broader range of individual experience in the vividness of an imagined image, which seems to be linked to the relationship between top-down and bottom-up processing (Dijkstra, Zeidman, Ondobaka, van Gerven, & Friston, 2017) where the perceptual areas of the brain work together with the imagery areas of the brain. Dijkstra, Bosch, and van Gerven (2017) found that large differences in vividness between individuals correlate to "the neural overlap between imagery

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and perception in the entire visual system" (p. 1367). A vividness scale can measure these differences (Fulford, Milton, Salas, Smith, Simler, Winlove, & Zeman, 2018). This work in cognitive science suggests that there might be vividness "superstars" but for many of us, what we see through imagining is not as vivid as what we actually see. Mendelsund (2014) speaks to the idea of vividness and what goes missing for us when a text invites imagination that only partially builds a human presence. Gaps remain in the construction of a face and body that allow other more important behavioral qualities to have a greater say in the imagining realm. That most cannot imagine with the same vividness that they actually see, makes the direct experience of seeing evidence as re-presentation in Inter-play so powerful. But when stuck in the can't-or-won't conundrum, a kind of mind's eye selective exposure continues to preference what already exists in that mind's eye. When can't-or-won't is strong, it could be best to welcome the given, the existing mind's eye view, into the experience and allow the new to join it.

## Given-New Collaboration

In this world of given-new, acknowledging the existence of the imagined, established idea is the first part of a two-part plan that respects where the audience is coming from—wherever that might be. Their established ideas are simply *the given*, the prior knowledge that will link to new references and associations. It is a process that adapts the given-new contract (Haviland & Clark, 1974; Hupet & Le Bouedec, 1977). But the outcome and reasons for employing the given are not the same as the given-new contract. Therefore, I call this process given-new collaboration.

The classic given-new contract begins with what the reader already knows. For example, understanding subtraction begins by remembering how addition works. Properties of the given make it easier to understand addition's opposite. This strategy lessens the time that it takes to comprehend new information.

The adaption, *given-new collaboration*, similarly starts with what the audience knows and therefore can imagine. The individually significant perspective is the given. It is critical to bring it to the surface because the associations that individuals imagine build a nest, a context, into which the new idea can be placed. As Aitchison (1994) points out, new ideas can be linked to old contexts. As Farmer and Maister (2017) suggest, our

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sense of self is somewhat plastic. In building a nest of existing associations, designers can create a link between what is in the nest and what is about to join it. The imagined idea must be strongly established, because the nest should not easily disappear or degrade. Its origins in the given should stay intact even as its contents evolve.

Into that imagined nest of the given, we add the new idea that is not imagined because the audience cannot do it. It is created through re-presentation as well as re-articulation. While the given is imagined at varying levels of vividness, the new contains the direct and indirect experience that the audience needs, represented by image, text, and typeface. This approach holds the promise of giving the new idea more weight as it is now more "stuck" to the old idea. Because of its concrete nature, these collaborations are available for re-seeing and rereading.

In given-new collaboration, two systems reference each other and increase the potential that new associations will link to the given already in the nest. As the examples in this chapter will show, once the two are respectfully linked, they become more difficult to separate. The nest provides space to compare the two and hold them in common. When the new information is revealed, it is for the purpose of remodeling the nest, altering assumptions as the weight of the new idea impacts old thinking.

## The Strength of Dissonance

New information as text alone demands the audience imagine its visual aspects, giving more strength to dissonance because the weight of the new idea is weak (McGregor, Newby-Clark, & Zanna, 2009). The new idea must be stronger, more vivid, more real. It must be so strong that the new information resists change and can overcome cognitive dissonance, which is the sense of disruption felt when opposing perspectives interfere with an ongoing worldview (Festinger, 1957). Both views cannot be held at the same time.[1] One will end up having more weight.

Individuals must make sense of opposing perspectives that affect beliefs of all kinds (Brehm, 2007; Gawronski, 2012; Harmon-Jones, 1999). What we imagine to be true is what we tend to continue believing—unless the weight of new evidence changes our thinking. The motivating reason for the status quo, as Harmon-Jones argues, is "dissonant information has the potential to interfere with effective and unconflicted action" (p. 93). In

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other words, we need to remove that uncomfortable feeling so that we can get back to our lives. We cannot hold onto both the old and new ideas and still make forward progress. Dissonance theory suggests that we try to maintain the established idea in one of four ways. These include removing uncomfortable new ideas, adding more established ideas to increase their weight, reducing the importance of challenging new ideas, and increasing the importance of established ideas (Brehm, 2007; Mills & Harmon-Jones, 1999). As long as the established idea has more weight than the dissonant idea, uncontested action can continue. The new (dissonant) idea either must have more weight, or the established idea must have less (Mills & Harmon-Jones, 1999).

A dissonant new idea that must be imagined gives the audience less incentive to consider it. Why would they collaborate to create the very thing they seek to avoid? In fact, McGregor, Newby-Clark, and Zanna (1999) found that when individuals were asked to reflect on two opposing views, they tended to harden their attitudes toward what they already believe. They avoided the new that they had to imagine. *New imagining* next to *established imagining* is less effective.

Because of the strength of the established idea and our likely preference for it, successfully communicating a new idea presents an ongoing challenge. Because the established idea is engrained, a single experience with given-new collaboration will likely not be sufficient as a strategy for overcoming the established idea.[2] However, repeatedly engaging with a design that includes the imagined given coupled with a concrete new might increase the chance of success over time because the new would gradually gain more influence as the audience continues to experience an established nest that holds a new concrete idea that can replace the old one. The new idea delivered as both text and spatial relationships will be harder to ignore because it is more vivid and now lives within that established nest.

When imagined ideas are confronted by *new evidence* that is made concrete through actual syntax, semantics, spatial relationships, colors, textures, and visual dynamics, a preference for the new idea might begin to grow as it gains more weight. The experience will also be probative. Examples show that change can happen. Recall that Americans imagined a world in which we do not torture. It seemed impossible to imagine the atrocities at Abu Ghraib until the photographs provided that much needed visual weight.

Actual images are more likely to resist change because their spatial relationships are stable. With time and multiple exposures to the new idea, the

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hoped-for result is that the audience will decrease the value of the established idea and increase the weight of the new. In this way, given-new collaboration taps into learning by accommodation (Piaget, 1972), because it presents a situation in which an audience is encouraged to change existing concepts to fit a new experience.

### Approaches to Can't-or-Won't Using Sequenced-Play

The next three examples illustrate ways of linking an established idea to a new more dissonant concept with the intention of giving added weight to that new idea. This approach gives the audience agency to consider what they know and weigh that information against the new idea. Sequenced-play is well-suited to this task. It sets up over-time experience to explore the effects of motion and stillness, sound and silence in both time/motion and static sequences. This type of Inter-play offers powerful ways of weighing the value of established ideas that we easily imagine against the new meaning that we do not. Time/motion pieces have a history that designers like Dan Boyarsky[3] have developed in the classroom, resulting in examples that are informative, poignant, and suggest the value of this direction. In time/motion, as opposed to film, typography plays a key role, placing it within the scope of Inter-play and complementary meaning. Time-motion can design prior knowledge into the experience and challenge it.[4]

In addition to time/motion, the opportunities in virtual reality (VR) are instructive. While those I have seen do not include typography, VR games can allow us to share what it feels like to be marginalized (Day, 2019), and respond to that experience. Farmer and Maister's (2017) work suggests the value in VR for addressing bias. They note that our sense of self influences how we relate to others, but that existing sense is malleable in ways that can reduce social prejudice.[5] It is still an expensive avenue, one that the user must actively select, suggesting that other avenues should be explored as well. The approaches that follow live in two categories: explicit invitations to imagine and implicit invitations to imagine. The first is an explicit invitation. The second two are implicit.

### An Explicit Invitation to Imagine

*What Gives Power* emerged from a class project (figure 7.2). It is the embodiment of Friedman's (2000) knowledge creation cycle, because Emma Van

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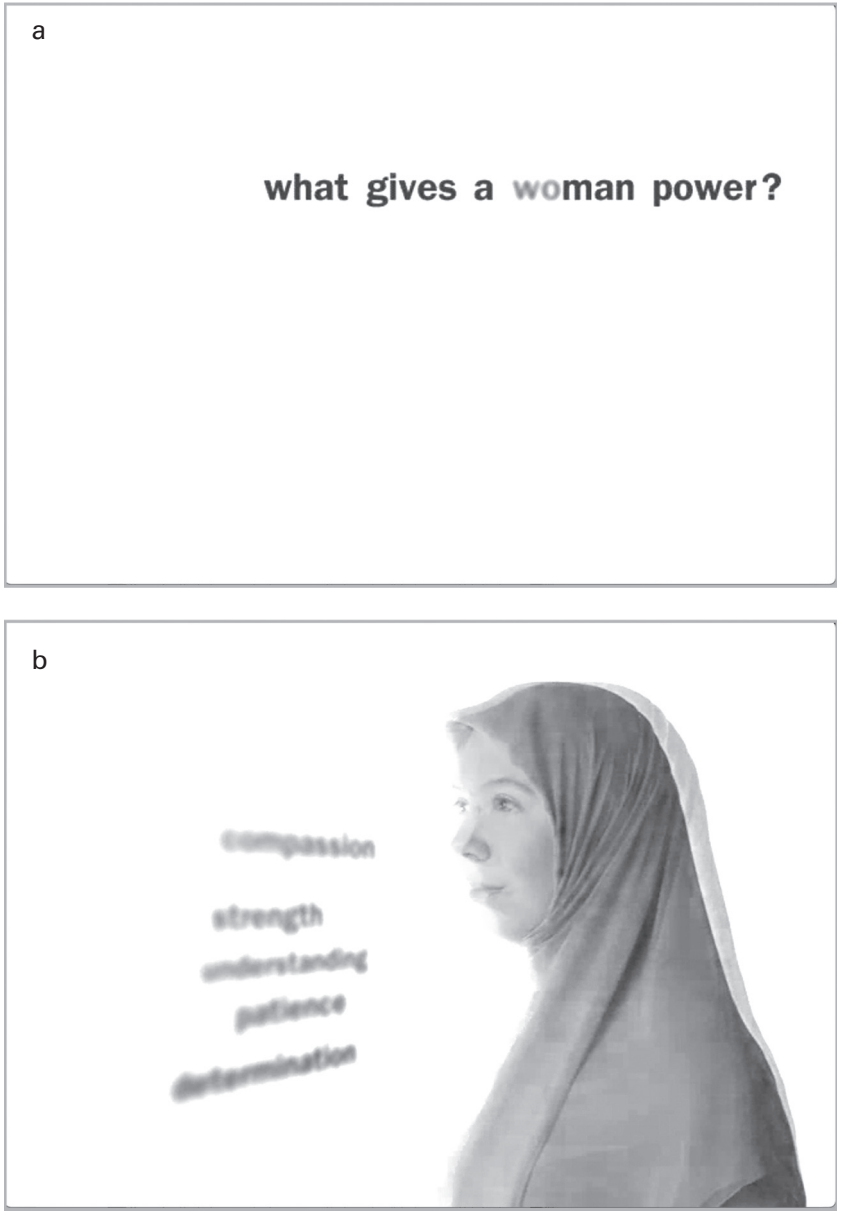


**Figure 7.2**
What Gives Power? (Designer: Emma Van Niekerk). © 2002. Reprinted with permission.

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Niekerk's work inspired this entire chapter. The project emerged because members of the Islamic Center of Pittsburgh, particularly the women, felt uneasy, concerned that members of the community hated them. Our first step was to go out into the community informally interviewing participants to discover if that perspective was correct or if something else might be going on. Van Niekerk's team found in that convenience sample that for her interviewees, hate was not on their minds. In fact levels of dislike were not recorded at all. Instead, the overwhelming feeling was one of pity, and avoidance because of pity. The clothing that Muslim women wear was the reason for this feeling. This data led to image and storyboards that eventually transformed the concept of pity from abstraction to a link between a lack of power and the abaya and hijab. That assumption was far from the truth. The women we worked with were doctors, accountants, and too many other professions to name. It was impossible to look at these women through the lens of pity.

As work continued, the process shifted to the idea that simply being a woman ties to a power differential, which a larger audience could relate to. The finished piece, a time-motion example of sequenced-play, begins in stillness and silence. On a black background, the question comes up, What Gives Power? Text asks the gender-neutral question as the experience begins. Individuals are invited to tap into deeply rooted cultural and individually held perspectives on power, inviting the audience to build a nest before adding "What gives a man power?" The text quickly separates to make room for "woman" as the screen goes from black to white.

While the first question is broad, the second, "What gives a woman power?" (figure 7.2), narrows the context while still inviting broad imagining of women in general or of some particular woman a person might see as powerful. More questions continue to invite individual nest-building using culturally charged keywords.

Keywords help us recall existing contexts or mental models (Hackos & Redish, 1998). New ideas, placed into those contexts, create new associations (Aitchison, 1994). But when the magnitude of the dissonance is great, how do we best forward the argument to give increased weight to the value of the dissonant idea? This example uses the commonplace possible/impossible to apply ideas of power to every woman by using the same words for the comfortable imagined everywoman as the uncomfortable new.

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The questions that build the comfortably imagined everywoman in *What Gives Power* are not neutral. They lead the viewer to consider qualities of character versus physical qualities. The power of compassion is compared to the power in a physical quality—the first being calf muscles.

"Is it her compassion or her calf muscles?" (Compassion fades out as the next question comes in)

"Is it her strength or her silken hair?" (Strength fades out as the next question comes in)

"Is it her patience or her perfect figure?" (Patience fades out as the next question comes in)

"Is it her determination or her designer suit?"

In their references to sexism, the questions might be somewhat uncomfortable, but they simply present two choices for imagining. No one has to publicly state an answer. Qualities of character fade because they are abstract and harder to imagine unless you attach them to a specific example with physical characteristics that are easier to imagine (Holcomb, Kounios, Anderson, & West, 1999). This design does not produce those attachments—not yet.

In inviting the audience to build a nest, text alone asks these ongoing questions and uses typography in a simple bold sans serif whose physicality suggests a sense of Doyle and Bottomley's (2009) Potency. Aside from that typeface, the video does not show pictures of Melinda French Gates or Beyoncé as two opposing perspectives on a woman's power. Instead, it asks that you imagine your own view, your own nest that holds the concept of a powerful woman. The particulars are up to the audience.

Inner qualities blur, while physical features stay sharp as we are invited to imagine other powerful attributes beginning with *strength* as opposed to *silken hair*. The blurring is interesting because it suggests a phenomenon concerning how quickly participants make connections with concrete words versus abstract words. It bears repeating that concrete words tend to produce connections more quickly while abstract words need more context (Holcomb, Kounios, Anderson, & West, 1999). As those harder to imagine qualities fade out, new qualities of character continue. Understanding, patience, and determination appear, blur, and fade, as the physical aspects include unblemished skin and perfect figure.

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As these suggestions of power continue, the nest remains private and personal. But into that nest the new idea will soon appear. Unlike a book, video controls the sequence and the timing, providing a set time for imagination and reflection to build the individual nest—and the shift.

The full set of imagined characteristics ends with her "designer suit." This is the moment where *the given* and *the new* will begin to collaborate as the words "designer suit" travel from the bottom left to the top right, and then dissolve and build a shape that covers all the physical qualities—revealing a woman wearing the shayla.

With those physical qualities covered, we see the new idea of a powerful woman, one that might not as come to mind for many Westerners, especially considering that this piece was first created in 2002. The "designer suit" covers the names of physical qualities, as it does in life, as an actual woman appears that many would not think to include as powerful. The stereotypically pitied woman, who represents an American Muslim woman in a shayla, is now linked to that existing nest, the powerful nest. The nest is not about a woman "to be pitied." It houses the dual aspects embodied in women that each individual saw as powerful. But now new images link to old imagining. The vivid image of this woman now shares a mental space with imagined powerful women, a space that this woman might not have entered before. And while calf muscles, silken hair, and unblemished skin once dominated the scene, the tables have turned. Now what we see embodies a set of abstract characteristics attached to the woman herself. It is important that we not only see her, we also hear her. Sound contributes further evidence of power as we hear her explain that her physical qualities take a back seat to her compassion and strength. She states:

> I get my power from my compassion, my strength, my understanding, my patience and my determination.

The absence of physical qualities, and the stress on qualities of character, adds vividness and presence within the new context. This woman's strong voice, rather than an imagined voice, describes why she belongs in the nest with powerful women when she states what we do not see:

> Do not pity me. I take power from my piety.

This ending statement was a response made by Muslim women after being told about the interviews with non-Muslims—the consensus by

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non-Muslims that pity was the correct perspective. Pity might lead to imagining a soft, weaker voice. The evidence of a strong voice contradicts that possibility. Sound as meaning and imagination also contribute to this nest, setting up a new space for reflection concerning the concept of power and how it might be defined. The woman in this video was a student in the class. Like so much classroom work, time and budget demand it. But this student reflected the strong voice and professional presence of the Muslim women we worked with who were from many places in the world including the United States.

Imagine for a moment that this sequential experience was a single poster with the same claim and reasons, "I am powerful." Without an existing nest for this woman to enter, she would continue to exist outside of it, her claim of power easily degrading into nothing. The new idea would likely have less weight because it did not share a context with the existing idea.

Exploring invitations to imagine, as we ask an audience to consider new ideas in light of their existing contexts, might not only help audiences become more effective collaborators, it also might be a useful way to help other disenfranchised groups become better understood by mainstream groups as part of an ongoing process. But invitations do not have to be explicit.

### An Implicit Invitation to Imagine

Prior knowledge creates an implicit invitation to imagine in *Maus* (1986). Art Spiegelman's graphic novel of the Holocaust that reveals his parents' experience as Jews during WWII in Nazi Germany and the consequences of that time on his own life. There are many angles of analysis on this work (Berlatsky, 2011; Elmwood, 2004; Ewert, 2004; Hirsch, 1992; McGlothlin, 2003; Tabachnick, 1993). I hope to offer another rooted in its invitation to imagine. Spiegelman has the difficult job of graphically portraying unspeakable horrors while encouraging his audience to stay within that horrific experience. The author portrays Jews, Germans, and Poles using distorted cartoon mice, cats, and pigs. While Tabachnick (1993) points out that these animals are masks that people know aren't real, Ewert (2004) notes that the visual elements contribute to the narrative as when "the German cats are drawn in such a way as to emphasize their ferociousness: eyes slitted, fangs drawn" (p. 183). These many animal stereotypes remind

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us that Spiegelman's "given" lies in the dehumanizing ways that we can imagine each other. It is an implicit invitation. We have not been asked to bring in our individual givens about how we imagine the humanity of different nationalities and races. But we must imagine that people live behind the masks, or we will not be able to make sense of this book. The characters would become actual mice. It is an imagined view that echoes Mendelsund's argument for what we see when we read—full of holes but very persuasive.

The use of different animals makes it clear which group a person belonged to and was especially effective when Spiegelman's father and mother disguise themselves as Poles (mice in the guise of pigs, which they can't quite pull off). When Anja, Spiegelman's mother, finds it difficult to hide the fact that she is Jewish, Spiegelman provides a clever way to show it as Anja hides behind the mask of a pig but cannot hide her mouse's tail. That image inter-weaves with the text of his father's interior thought, his fear for her. The image invites us to consider the real danger while imagining through a distorted lens.

Spiegelman's distorted shapes and symbols allow the audience more space to reflect and add to the nest. As part of the concrete new, we see what it is to not be able to lose your tail, as we imagine the fear in that moment. We are not invited to know what Anja really looked like, only what the feeling of not fitting in must have done to her. We add that to the nest.

As sequenced-play combines with inter-weaving in the cartoon's cells, Spiegelman's distorted shapes and text continue to build a narrative that again becomes unexpectedly frightening when Valdek and Anja find themselves in Nazi territory walking on the swastika. That symbol, which is bigger than both, is a moment where the imagined and the concrete come together. We see them surrounded by the concrete symbol that for them means death.

Spiegelman describes Hitler's constant reference to Jews as mice and rats, but he also relies on our prior knowledge of human behavior and our familiarity with anthropomorphized animals in cartoons. *Maus* uses the device to serve the purpose of revealing what humans should never have to endure, including the next generation that would deal with it on a different level. Prior knowledge of Hitler, his campaign against the Jews, and the fight to make Jews seem less than human inform this external-implied bridge. Prior knowledge also reminds us that these are human lives even in a world where mice are Jews, cats are Germans, and pigs are Poles. In

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the guise of these cartoon faces, it is possible to look at Spiegelman's drawings of dead young women after they have been hung by the Germans in the woods because they are still in the guise of mice. The re-presentation removes the audience from reality just enough. Spiegelman's decision makes the impossible to look at possible for the purpose of communicating the horror and complexity of these lives. Being immersed in that cartoon world starts to seem more actual over time, which continues until the end of the book when Spiegelman places a substitution-proxy on one page that is both shocking and heart breaking. In that spread, cartoon "photographs" of Jewish mice represent their lives in earlier times before the war. By that time in the book, we have become fully acclimated to that cartoon world. It is at that pivotal moment that Spiegelman inserts an actual photograph of his father, a picture he had taken after the war, substituting the real man for the drawn mouse, reminding us of the fact that humans, not animals, endured these atrocities.

Berlatsky (2011) argues that Spiegelman's decision to insert the photograph shows that even those images are far away from the actual. Just as the cartoon places a layer between them and us, the photograph does not show the real person. I would suggest that the cartoons Spiegelman draws, over the course of reading, become their own prior knowledge. We become used to them and get to know these people through a lens we will never have to inhabit. Then with the turn of a page, the picture of his father, Vladek, offers a shock to the system. While the photograph was staged after the war, it is a moment of realization that a human being who lives in our world, not the cartoon world of the book, went through these atrocities. It disrupts the acquired prior knowledge gained in the pages, providing a more complicated view of the people who lived through those times, the lives they affected afterwards, and the closer connection between them and us.

While Spiegelman shows us his real family three times in the story, the last photograph expresses the potential in given-new collaboration most effectively.[6] While the sequence of distorted, non-objective, and realistic images offers expressions of time that make them distinct (McGlothlin, 2003), the changing use of shapes takes us to a person. On page 294, the new emerges through a realistic image as Vladek looks through family photos. As he considers how much he misses everyone in those pictures, Spiegelman introduces the difference not just between image and text, but also between image and image. Vladek begins his reminiscence about the family

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photos, while he is in the same imaginary "skin" he has been in from the beginning of the book. His mouse self continues that concrete representation. That fuzzy imagining gives way to the dissonant new—the realistic shapes found in an actual photograph of his father.[7]

After becoming so used to the distorted shapes, the photograph answers some of the questions that have been forming in the nest. It shows us the contrast of a real person with real faults who endured real suffering. It is a chilling comparison. Spiegelman does not allow our hazy imagination to let us forget that real people went through these trials, humiliations, and horror. The author places the new realistic shape of a human being into the context of the imagined people hiding behind masks. The new is a reminder that Spiegelman has not been offering multiple representations simply to fit a convenient set of biases that separate types. On page 294 we are reminded that Vladek looks like us. He does not look like one of Hitler's mice. These cats and mice are human after all, with all that implies.

In the process of inviting implicit imagining, the example suggests the importance of carefully considering the four different kinds of images—realistic, distorted, simplified, and non-objective. Had he employed photographs as a default view, he would have cheated us of nuance and opportunity. Designers need to experiment with implicit invitations to imagine in given-new collaboration to link established ideas to those that we either have forgotten or don't yet accept.

### Implicit Imagining in Fracking

Dangers of Fracking is a website created by Linda Dong in 2012 when she was a design major at Carnegie Mellon University in Pittsburgh (figure 7.3). A lot has happened since then, but at the time fracking was somewhat new and the city was not far from the drilling. Fracking is the process of removing natural gas from underground shale rocks. In creating this given-new collaboration, the site opens to a pretty world as we might have seen it in storybooks as a child. Because we see a simplified drawing instead of a photograph, we can build an imagined nest of a place that is safe and sunny. In that imagined nest, the words "Hydraulic Fracturing" seem equally safe. The word "fracturing" substitutes for the word "fracking," which has a harder cracking sound that might feel out of place in the spatial world of green landscapes and blue skies. The nice nest invites us to see and read

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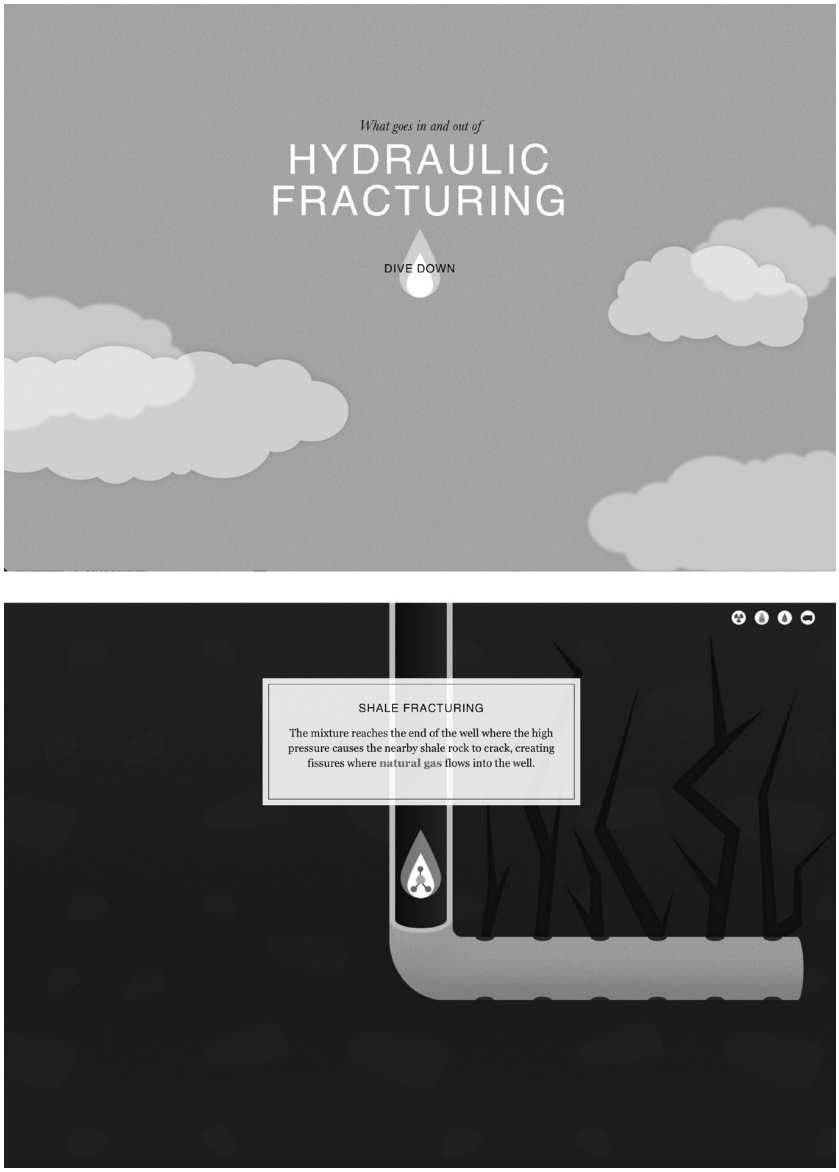
What goes in and out of
HYDRAULIC FRACTURING
DIVE DOWN
SHALE FRACTURING
The mixture reaches the end of the well where the high pressure causes the nearby shale rock to crack, creating fissures where natural gas flows into the well.

**Figure 7.3**
Dangers of Fracking[8] (Designer: Linda Dong). © 2012. Reprinted with permission.

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more, to literally "dive down." But this implicit invitation to imagine our own bright and sunny worlds takes us to a new and darker vision that will show why what we see from above does not represent what is happening below. Into this nest of seeming safety, the text becomes more foreboding and so do the images, placing a new darker world into that safe nest, suggesting a need to protect the surface as what is above and what is below form a tighter bond.

In a site that starts with a neutral perspective and ends as an argument against fracking, these simplified illustrations of everyday scenes invite the stakeholder to imagine a pleasant experience. Again, as this site was created in 2012, the term was familiar but not fully appreciated. The website uses parallax scrolling so that the background moves at a slower rate than the foreground. It allows the scene to maintain continuity as the textual description of the fracturing process changes. Only two of the scenes are shown here, and as the scroll continues past a view of the sky (figure 7.3), the question, "What is Hydraulic Fracturing?" pairs with the command, "Dive Down." The experience continues until visual information becomes as negative as the text we are invited to add to the nest. As the scene continues with the scroll, the first box states,

> **SO WHAT IS IT?**
> Hydraulic fracturing, or **"fracking"** is the process of drilling and injecting fluid into the ground at a high pressure in order to fracture shale rocks to release natural gas inside.

The text is in a black box, but it seems to have been placed in that dark container so that it can stand out in contrast to the bright scene. The scene still looks so pretty. It's easy to imagine that fracking is not so bad because it's in this nice place. The nice surroundings and the parallax experience encourage the user to continue.

As scenes change, they support the movement of a black box with changing textual descriptions. The next is,

> **TO THE SITE**
> Each gas well requires an average of **400 tanker trucks** to carry water and supplies to and from the site.

While that's a lot of tanker trucks, the scene is still pleasant and easier to see than 400 trucks. Facts continue about the water needed for this process.

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When we reach the plant, brown colors start to change the direction of the positive scene.

The bright nest changes as we enter a darker world to learn about pressure deep in the ground and the resulting contamination. This world of web experience is no longer the happy place it once was. We see what is really happening in a scene that has gone completely dark. It takes a sudden turn as the viewer dives down from blue sky to a deep underground pipeline, as the site continues to describe the process. It is devoid of color with cracked lines where the ground has broken, providing a more ominous outcome. And in that colorless space we see that danger has been added, and it cannot be fully removed. The text is paired with dark visual context that matches the sense of a community in trouble. Underground water, when it is shown, is now contaminated. This is when the fact that, "there are more than 500,000 active natural gas wells in the US" begins to hit home. That is 500,000 in 50 states, many of them in Pennsylvania.

In the final part of the description, the audience has come out on the other side, only to learn waste fluid is emitting compounds into their atmosphere. Having learned the definition of fracturing, what causes it, and one way to value it, the audience is called to action. This implicit invitation to imagine a bright new world becomes a space to learn about a process that is more toxic than first thought. In this given world of simple drawings, we can imagine our own homes and what might happen as the world gets dark in the presence of disturbing textual facts, ending with the call to action. The given aligns with the hopes that many imagined. Fracking will enrich communities. The new, going into the nest of hopes, is informed by darker facts.

## Conclusion

Inter-play gains value when needed re-presentation in images takes the stage with needed re-articulation in text. Their complementary differences are rooted in their expressions of direct and indirect experience, the functionally independent systems that have the capacity to interconnect. This book's framework, which introduces Inter-play analysis based on the principle of relative certainty, looked at the strengths and constraints in image, text, and typeface to answer W. J. T. Mitchell's question, "what difference do the differences make?" It shows how image meaning born in its spatial

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relationships, colors, textures, and visual dynamics offers what text cannot. It explains how textual meaning that lives in statements, questions, and demands offers what images cannot. These two complementarily different elements combine through Grouping and Bridging Ties to produce four loose to tight unions of Inter-play that can utilize image/text/typeface relationships in ways that are probative and non-probative.

Two non-probative types have Grouping Ties but no Bridging Ties. These are the non sequitur and decorative. Three non-probative types do have Bridging Ties. These are feely Inter-play where proof is not possible, truthy Inter-play that eases processing without evidence, and fantasy Inter-play that builds from bigger than life characters or the curated life. The two probative types are reinforcing Inter-play and complementary meaning. When complementary elements combine as complementary meaning, new associations and references between image, text, and typeface emerge as claims with reasons or evidence, bringing with it the opportunity to address inexperience and bias. I argue that at a time when bias and inexperience have the potential to be more destructive than ever, more focus must be placed on understanding *all* the available means of persuasion. Writers and designers, who are in the best position to work on the communication aspect of this problem, need tools that help create multiple kinds of relationships between text, typography, and images. In this book those relationships take forms that clarify, contradict, or challenge existing views. Finally, I argue that sequenced-play might have the potential to address the can't-or-won't conundrum, the situation where an audience prefers their established way of thinking so much that new references and associations have a harder time making inroads. My hope for this book is that it will capture the imagination of those who wish to study these ideas further, including designers and writers who explore the potential for complementary meaning to address ongoing problems, thereby continuing Friedman's (2000) knowledge creation cycle of theorizing and reflecting, articulating and embodying. And as we explore the potential for positive change that Inter-play offers, we must also be on guard for its opposite—the unintended consequence of good intentions.

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# Notes

## Before in Time and Place

1. The Fence is a university landmark where students paint messages in the middle of the night that range from the compelling and provocative to the informational.

2. Twilight Zone Season 1 Episode 12, Lewis Padgett, air date December 25, 1959.

## Introduction

1. To see this design go to Sal Devito's portfolio piece 26 at https://www.graphis.com/master-portfolio-slideshow/sal-devito/advertising/.

2. Paivio (1986, 2007) offers insights on this phenomenon considered in more detail in chapter 1.

3. Not everyone has the same capacity to imagine sounds (Faw, 2009).

4. Apologies to anyone I might have missed.

5. As does Baddeley (2010) with the interaction of the "visuo-spatial sketchpad, and . . . the phonological loop" (p. R137).

6. *Perception in Art* (1974) does include an example of the London Transport Map but a satisfying account of its textual elements is outside the scope of Arnheim's work.

7. My work from 2007 does not predate the following people, but my use of cohesion is dissimilar. Zancanaro, Stock, and Strapparava (1997) focused on natural language; Kitis (1997) considered cohesion but here only briefly as part of a larger project; Lemke (2002) adapted cohesion to within-modality cohesive visual ties (e.g., repetition of color); Royce (2002) looked at the image through the lens of text arguing that "the visual and verbal modes complement each other to realise an intersemiotically coherent multimodal text" (p. 192). Van Leeuwen (2005) used the lens of the conjunction outside of Halliday and Hasan's influence. Martinec and Salway (2005) considered the clause complex, wedding images to the semantic relationship.

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8. I do not employ RST (Rhetorical Structure Theory). RST's hierarchical structure conceals the experience of idiosyncratic looking. In "Rhetorical Relations in Multimodal Documents" (2013), Taboada and Habel note this problem; "[t]he most significant implication of the research . . . is the potential presence of multiple relations between a particular instance of depictive material and different parts of the text" (p. 85). The authors believe multiple relations suggest the need to reconsider the hierarchical tree-structure of RST.

9. I use the term "probative" as employed by Zhang, Newman, and Schwarz (2021).

10. René Magritte painted *The Treachery of Images* in 1929, making the point that the object offers qualities that the image cannot imitate.

11. This is a case of Grouping without Bridging Ties.

12. Others, notably Kjeldsen (2015ab) and Gries (2015), feel this difference but come from other angles of viewing than mine.

13. Meggs's categories in *Type and Image* (1992) provide an important step toward, but not an arrival point, because clear boundaries between each category were not fully realized.

14. Their study focused on commodities rather than people because it was easier to manipulate how familiar the participant might be with an object (e.g., participants would know a pearl from wool, but likely would not know that "betel" is a leaf). Participant levels of familiarity helped the researchers identify one of two possible reasons why truthiness could increase.

15. See Zhang et al. (2021) for a more detailed look at the reasoning behind images of commodities rather than people.

16. Kjeldsen (2015a) includes a longer list of genres studied. Many are interesting in their own right, but outside of the scope of this book because they are either not print or web based (e.g., tattooing) or not Inter-play (e.g., photography).

17. The non sequitur uses only Grouping Ties.

## Chapter 1

1. While typeface is a key player in complementary meaning, its hybrid qualities are sometimes embedded in the conversation on image and text.

2. Considering the visual/verbal scope of my work, I do not employ Sadoski and Paivio's work on reading and writing (2013) except to touch on their thoughts about meaning. Their book *Imagery and Text: A Dual Coding Theory of Reading and Writing* offers important insights, but its focus on literacy and the imagen as a valuable resource of references and associations is outside of the interests of my work.

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3. Some other languages, such as German, rely on cases to do what word order does in English.

4. For the purposes of limiting variables, this chapter does not consider symbol systems like sign language, but future work might want to.

5. Harrison Bergeron is a character in a short story of the same name. Vonnegut writes of a world in which everyone has to be equal. "Handicaps" include weights, masks, and helmets that hide physical ability, beauty, and intelligence.

6. Kress and Van Leeuwen (1996) developed a four-quadrant structure, meant to encourage normative reliable patterns. In this aspect of their work, the authors argue that the image can be reliably divided into given, new, ideal, and real sections.

7. The social situations Kjeldsen (2015b) focuses on, while important topics, are inflammatory (abortion, smoking, gun control), which might lead readers to relegate the image once again to appeals to emotion, which concerns Kjeldsen who suggests that the benefits outweigh these concerns. I agree that there are important benefits in visual information, but it need not be limited to either those that inflame our passions or are simple realistic representations.

8. DeAngelus and Pelz's (2009) findings reinforced Yarbus's (1967) work but with less dramatic results. I use Yarbus because it is easier to describe those outcomes.

9. Chapter 3 shows why task-based looking is also useful when creating complementary meaning.

10. Michael O'Toole's project, *The Language of Displayed Art* (1994) seeks to increase areas of notice through semiotic engagement. Task-based looking invites the viewer on a search for language to explain what the individual sees in displayed art. O'Toole's scope is outside that of this book because the interesting conversations it could elicit would be largely personal, moving away from my interest in what the image more reliably communicates. Our own histories and interests (Solso, 2003) would have an influence on looking, even with prompts.

11. I will later show that the problem Putnam (1975) finds with senses, variations on the meaning of one word, is the strength of complementary meaning where the intention is to alter senses.

12. Accessibility issues such as color blindness are important to consider but outside of the scope of this work.

13. Kress and Van Leeuwen (1996) were also inspired by Arnheim as they developed their grammar of images.

14. As Müller, Kappas, and Olk (2012) note, "differences in interpretation suggest that analyses of visual exploration and reactions should take the individual

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interpretation into account and not assume a priori that the meaning of an image is shared by all viewers" (p. 320).

15. Richard Hollis profiled Loesch's work in 1997. That piece engaged my imagination and opened my perspective on the intriguing interactions possible.

### Chapter 2

1. It would be interesting to see how Dorst's (2019) insights on design abduction as a framework for desired outcomes work with the principle of relative certainty and the roles, relationships, and outcomes of Inter-play linked to problems that benefit from communication solutions.

2. To keep the text flowing, I fold stasis into the analysis sections.

3. Koch's (2012) study is intriguing, but I emphasize Doyle and Bottomley's (2009) findings because 76 percent of Koch's participants had some design training, making it more difficult to know if the effects would carry over to other populations.

4. Doyle and Bottomley's (2009) work employed a *semantic differential* scale to measure the kind of meaning a single typeface is likely to carry. This method asks participants to consider how heavily weighted an aspect of the type might be using words from a set of opposing pairs. Participants measure their weight on a 1 to 7 scale. For example, using the 1 to 7 scale, a typeface will be rated as more active/passive, good/bad, hard/soft. The participant then decides how closely the typeface matches one or the other of those two words on the 1 to 7 scale, with 4 meaning neither has more weight than the other.

### Part II

1. See the introduction for information on the aspects of Arnheim's (1974) *Perception in Art* that inspired Grouping Ties.

2. See the introduction and chapter 4 for more on aspects of *Cohesion in English* (Halliday and Hasan, 1976) that inspired Bridging Ties.

### Chapter 3

1. While Engebretsen (2012) argues that more attention should be paid to images and typographic structures, he conceptualizes this process differently than I do.

2. In 2007, I used a different term for Grouping Ties and its subsets.

3. The non-sequitur effect is of course not limited to Inter-play (e.g., Do you want a pen? No, I'm driving later.).

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4. My 2007 article used different naming conventions. I hope that these are simpler and better describe their functioning.

## Chapter 4

1. Mr. Peabody invented the first Wayback machine so that he could show Sherman more about the world. Who can forget, "Sherman, set the Wayback machine to . . ." A later use of the term describes the internet archive. https://en.wikipedia.org/wiki/Wayback_Machine_(Peabody%27s_Improbable_History.

2. Of course, "the monster" is also, a metaphor.

3. Cultural and historical relationships also occur.

4. Doyle and Bottomley (2009) define Roman as a regular typeface (not italic or bold).

5. I avoid the term intertext when discussing Inter-play because it emphasizes indirect over direct experience.

6. Encouraging this move is complemented by referencing-images, which are covered in the next section.

7. A change to the original text was not permitted in this exploration.

## Chapter 5

1. As noted in chapter 2, another reason to separate the structural from the functional lies in the meaning-making opportunities available when functional bonds are partially broken.

2. Placeholder text provides a sense of what a space will look like when populated by letters of a certain size and shape in a configuration that includes the length of the line of text (linelength) and the distance between lines of type (leading).

3. I considered that the words "Place and Function" might be repetition ties with the image. However, the one is so structurally far from the other, that the connection is too fragile to carry off this kind of tie. Inter-play should not require the user to become sleuth, looking for options that are too tentative. If that begins to take place, the problem of every thing meaning everything robs the system of its vitality.

4. The classic is McCloud (1994).

5. For a more detailed examination of cartoons, of course see Scott McCloud's *Understanding Comics* (1994) for the detail he brings to those transitions from box to box.

6. In their book *Type, Image, Message: A Graphic Design Layout Workshop* (2006) Skolos and Wedell examine posters for their image/text relationships. It would be

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interesting to know if their four compositional partnerships might fit within this framework, expanding the opportunities for inter-weaving.

## Chapter 6

1. Spiegelman's *MetaMaus* (2011) provides an in-depth reflection on his process and reasoning.

2. I use the word ideas instead of meaning to maintain a more limited definition of meaning as what we share versus thoughts that are privately held.

## Chapter 7

1. Areas of disagreement exist concerning dissonance's functioning that include whether it is universal or culturally limited (Gawronski, 2012), and what makes a sense of dissonance larger or smaller (Brehm, 2007). This book takes Gawronski's position that dissonance is a universal experience that might need culturally sensitive approaches, which designers and writers will need to discover over time.

2. It would be foolish to argue that any single encounter with Inter-play would be sufficient. Intractable problems require multiple avenues that encourage debate, discussion, and change. But as one of many approaches, it holds promise.

3. Dan Boyarski has been a leader in the development of the form. His talk is at: https://www.youtube.com/watch?v=D_aN2XDmOog.

4. As part of future exploration, the Stroop effect is an interesting avenue. See Hagan (2019), *Challenging Expectations: Using the Stroop Effect to Encourage Meaningful Reflection in Motion Design Experience* from the MODE proceedings.

5. In VR, simulating the social challenges outsider groups face can help insider groups understand what that feels like. The authors looked at the use of virtual reality where an individual takes on the experience of an outsider as a way to lessen prejudice.

6. The first volume begins with a picture of his mother. *Maus II* has a picture of his brother on the dedication page.

7. While this exploration is sequence-focused, for other perspectives on *Maus* concerning the use of the photograph, see Hirsch (1992) and Elmwood (2004).

8. I ignored the title, *Dangers of Fracking*, that is in the url. It colors the takeaway from the start but I place my focus in the major design area.

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